Feasibility Study

Towards a New Higher Education Strategy 2016-2025 of the Republic of Armenia

Manja Klemenčič

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Foreword

In today's globalised world, the normative environment that shapes what is valued by governments and higher education institutions has been extended from national to international contexts. Thus, the decisions on what are viable and – indeed – desirable governmental higher education policies in one country are often shaped by international policy regimes, which diffuse policy ideas into national systems and by international developments, such as global rankings, which catch media attention. With small and developing countries that do not have the same higher education resources and human capital as some of the world's academic superpowers, striving for world class universities and fixation on global university rankings is not the best way forward. This is not to say that rankings should be ignored altogether. The rankings game raises attention among governments and institutional leaders to the questions of research excellence, teaching quality, internationalisation, the third mission, and so on. This is positive as it can create a favourable climate for higher education reforms initiated by the government policies and (hopefully) also organisational change self-induced by higher education institutions. Yet, reckless pursuit of ranking in league tables can lead governments and universities to lose sight of the needs and expectations for social and economic benefits that higher education is to yield to the communities and society in which they are embedded and which gave these institutions their life and purpose.

As the Armenian Government and the National Assembly and in collaboration with all relevant stakeholders embark on the process of preparation of the new Higher Education Strategy it is precisely the social and economic needs of their country they have to keep in mind and the challenges of their country that higher education could possibly address and help to resolve. How can higher education contribute most effectively to the advancement of human capital and well-being of all Armenian, to boost economic development, to create more secure and equitable society, to sustainable development and to civilizational advancement? What changes need to take place in higher education that these expectations are met? How can excellence in education, research and third mission activities be achieved across the higher education system? All these are large questions which call for rigorous and lengthy strategy preparation.

In my short visit to Yerevan and discussions with a number of actors, I am convinced that there is enough indigenous expertise among government, institutional leaders, representatives of stakeholder associations and business and industry and on-ground officers of international organisations to find a viable and desirable strategy. But as in every country, higher education strategy making is also a political process which brings to the fore the questions of whose interests are served, and whose influence is strongest. Open, inclusive and transparent strategy preparation can contribute to the legitimacy and general acceptance of the strategy points proposed; which are in turn necessary for the successful implementation of the strategy. Informed and involved stakeholders to feed into the strategy process from the beginning are a major resource in the strategy

preparation. In contrast, a potential 'democratic deficit' in strategy preparation and disassociation of key actors with the strategy threatens that, even if adopted, the strategy will remain only on paper.

One of my main frustrations when preparing this study was access to national data and data to compare Armenia with other countries in Eastern Partnership, some of data did not exist, some of it was not translated. I would strongly urge those drafting the strategy to pull together as much available data on the higher education system characteristics as possible and use it as evidence in the strategy. Given that the Ministry is relatively small and only a few officials working on the strategy, it would be perhaps helpful to create communities of practice around the strategy by involving local academics and practitioners to the task. Again, in my field work in Armenia I have met ample academics and practitioners highly competent to the task.

In my view, in smaller and developing countries, it is particularly important to build capacity for effective policy making, and such capacity includes: (1) rigorous, comprehensive and effective systems of national data collection on various higher education (research, third mission) indicators, (2) a sufficient critical mass of policy experts and academics to conduct analyses and studies, policy reviews, evaluation and impact assessments, and conduct basic research into higher education and knowledge polices more broadly; and (3) informed and involved stakeholders to feed into the policy process at all stages. These aspects are equally important in national policy processes, in influencing policies within international policy regimes (such as the EHEA) and to critically evaluate and examine policy recommendations stemming from international policy actors and/or funding agencies.

I am grateful to UNESCO for giving me the opportunity to study Armenian higher education system in depth, and in particular to Hassmik Tortian for her thoughtful guidance. UNESCO has played a major role in many countries in encouraging new thinking on policy and strategy development, offering technical assistance and initiating cooperation and networking. In this study, I have drawn on usable knowledge from higher education scholarship, recommendations developed in existing analyses and studies of Armenian higher education and on empirical data. My hope is that it will be helpful to those drafting the new strategy.

Finally, I have immensely appreciated and learned from the discussions with the team at the Ministry of Education and Science who are involved with the policy development in higher and postgraduate education: Karine Harutyunyan, Robert Sukiasyan, Tatevik Gharibyan, Harutyun Azgaldyan, and Anush Khachatryan. I also express my sincere gratitude to Arayik Navoyan and 36 interviewees for having shared with me their views on the current situation and changes needed. This report is ready now. Yet, the most exciting and most challenging part is only beginning: that of collectively imagining the desirable future for higher education in Armenia.

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List of Acronyms and Abbreviations

ADS – the Armenia Development Strategy (2015-2025)

AHELO – the Assessment of Higher Education Learning Outcomes

ANSA – the Armenian National Students' Association

ANQA – the Republic of Armenia National Center for Professional Education Quality Assurance Foundation

ARMENIC - National Information Centre for Academic Recognition and Mobility (ENIC) in Republic of Armenia

AYF – the Youth Fund for Armenia

CLA – Collegiate Learning Assessment

ECTS – the European Credit Transfer System

EHEA – the European Higher Education Area

ENQA - European Association for Quality Assurance in Higher Education

EQAR - the European Quality Assurance Register for Higher Education

EaP – the Eastern Partnership

EU – the European Union

EUA – the European University Association

ICT - Information and Communication Technology

IPRs - Intellectual Property Rights

MES – the Ministry of Education and Science

MOE – the Ministry of Economy

MOOC – the massive open on-line courses

NAS – the National Academy of Sciences for the Republic of Armenia

NATC - National Assessment and Testing Centre

OECD - the Organisation for Economic Cooperation and Development

QA – Quality Assurance

R&D - Research and Development

SCS - the State Committee of Science

SMEs – Small and Medium Sized Enterprises

SNCO – the State Non-Commercial Organizations

S&T - Science and Technology

UNECE - United Nations Economic Commission for Europe

UNESCO – the United Nations Educational, Scientific and Cultural Organization

WB – the World Bank

WEF – the World Economic Forum

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Executive Summary

Higher education strategy is an important document in every higher education system: it reiterates the values shared by the system stakeholders, does the "health-check" of the system, compares the system performance to other systems and benchmarks it against those particularly well-performing, communicates the goals and future orientations, and expresses political commitments to advancing higher education. In short, strategy documents evaluate the past, guide future action and commit to advancing higher education.

The present feasibility study provides a comprehensive review of the higher education system in Armenia. It draws on the primary statistical data, data obtained through interviews and on the numerous secondary policy studies, which have over the last decade analysed specific areas of higher education system and offered recommendations for reforms (see Appendix 1 for list of data sources). The feasibility study seeks to organise knowledge on higher education system in Armenia to serve as a background in the preparation of the new higher education strategy. It also seeks to highlight those areas which need to be further explored in the strategy preparation and should be specifically addressed in the new strategy to make the Armenian higher education system "future-proof".

The following questions guided this feasibility study:

1. *What are the capabilities of the Armenian higher education system and how these are influenced by major trends and (internal and external) developments? What are the key strengths (comparative advantages) and weaknesses of the system in terms of capabilities?*

2. *How does the Armenian Higher Education (HE) system perform in the areas of higher education, research, innovation and entrepreneurships? How does its performance compare to other systems in the region? What are the key strengths (comparative advantages) and weaknesses (underperformance) of the system performance?*

3. *What issues should be specifically addressed by the new Higher Education Strategy 2016-2025 and needs further exploration in the strategy preparation?*

The feasibility study recognises that in the short-run significant changes - either way - in funding of higher education in Armenia are not to be expected, and that higher education system upgrading needs to happen within the existing scope of funding. Therefore, the study has been prepared in spirit of consideration of how to do more and better without demanding more public

funding; and with conviction that higher education sector in Armenia can improve its societal impact within the frame of existing funding. This is not to say, however, that further financial investment in (higher) education and research are not needed. On the contrary: education and research are foremost drivers of social and economic development and growth and public investment in these two areas yields direct benefits to social and economic development. Education and research contribute to worker productivity and boost innovation, both of which are at the core of economic competitiveness. Investment in education is seen as the best way to reduce social inequality. As Piketty submits: "…the best way to reduce inequalities with respect to labour as well as to increase the average productivity of the labour force and the overall growth of the economy is to invest in education" (Piketty, 2014: 306-7).[2]

Changes in public finances especially in terms of value and distribution of collected taxes have significant repercussions on public education (as on other economic and social areas). Armenia has relatively low tax-to-GDP ratio and has faced challenges in tax collection. Lower tax receipts typically results in increase in public debt, and is accompanied by austerity measures in public spending, which inevitably affects funding for education, and especially higher education, where the balance between public funding and private contributions is already strongly titled to the side of private contributions. This is an area that needs to be tackled as part of the implementation of the Armenia's Development Strategy 2015-2015.

However, investment in education doesn't necessarily or automatically result in economic growth nor does investment in education automatically reduce inequality (Robertson, 2015[3]; Marginson, 2015[4]). These relationships are not necessarily causal. They are much more complex. Public investment in education is needed for the country to remain in the global competitiveness race. And individuals need to seek qualifications to remain in the race between competing social groups with unequal resources (Robertson, 2015). At the same time state intervention through careful policy and regulation is needed to mediate the effects of social class and privilege, which reinforce social inequalities despite education attainment. State steering is also needed to streamline resources and create enabling regulatory frameworks for fostering research excellence, knowledge transfer and socio-economic

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[2] Piketty, T. (2014) *Capital in the Twenty-First Century*. (translated by Arthur Goldhammer). Cambridge, MA: Harvard University Press.

[3] Robertson, S. (2015) Higher Education: A Solution to, or Problem in, Rising Social Inequalities? A keynote at the 2015 SRHE Annual Research Conference, 9-11 December 2015. http://www.srhe.ac.uk/conference2015/downloads/Robertson-SRHE-2015-Keynote-Address.pdf

[4] Marginson, S. (2015) Rethinking education, work and 'employability' Foundational problems of human capital theory. SRHE Annual Research Conference, 9-11 December 2015. http://www.srhe.ac.uk/conference2015/downloads/Simon_Marginson_Presentation_SRHE_2015%20.pdf

innovation. Knowledge systems (higher education, science, innovation and entrepreneurship) must be interconnected and coherent, reflecting the labour market needs and the social and economic development priorities.

One aspects of higher education persists: higher education institutions seek to attract talent – students, academic, research, and professional staff. The concentration of talent lends prestige to the institutions, to national systems and to the communities where these institutions are located (Klemenčič 2015).[5] It helps to 'reproduce' prestige, so to speak, because talent attracts more talent and talent attracts financial resources (for example by being more competitive in applying for European Union research funding or by attracting fee-paying students). Talent also feeds social development and economic growth through knowledge exchange. To fulfil these expectations, national higher education systems in most countries need upgrading, which also means integrating higher education systems with research and innovation.

The two key policy documents – the Armenia Development Strategy 2015-2025 and the draft Strategy on Education Development 2016-2025 collectively present important policy framework of principles and strategic orientations that directly or indirectly refer to and impact on higher education sector. However, there are several issues concerning higher education, which are due to a broader scope missing or are underdeveloped in those documents. These issues are highlighted in the list of recommendations which follows and they are further explained along with the analyses of capabilities and performance in the Section 3.

The forthcoming Higher Education Strategy 2016-2025 needs to be aligned with the two aforementioned strategies as well as with the national strategy on development of science and innovation strategy. It needs to be clearly and unambiguously linked to the strategic social and economic development priorities of the country. At the end of the day a measure of any strategy lies in its implementation. To ensure the implementation, the forthcoming strategy should include clear quantitative and qualitative targets, time line and indication of units and individuals within the units responsible for the implementation. Such policy coordination is a crucial step towards establishing an integrated knowledge policy and an *integrated knowledge system* of Armenia, which coordinated and enables knowledge production, dissemination and utilisation by education and higher education institutions, research institutes, and enterprises - private and public, for-profit and non-profit. Now that explicit policies and strategies for development of science and innovation are in place, the next step is to ensure that these are coordinated with education and higher education policies and strategies so as

[5] KLEMENČIČ, M. (2015). Internationalisation of Higher Education in the Peripheries: The 'gear effect' of integrated international engagements. In *Handbook Internationalisation of Higher Education (A 2.1-11), 22th supplement*, edited by Beerkens, E., Magnan, M., S Söderqvist, M. and H.-G. van Liempd. Berlin: Dr. Josef Raabe Verlag (Raabe Academic Publishers). http://www.handbook-internationalisation.com/

to promote integration, cooperation and pooling of resources, to avoid duplication and costs due to fragmentation and to works towards synergies in achieving societal and economic benefits. Links also need to be made to technology and industry policies and strategies, especially in the area of information technology and broad utilisation of ICT, which has been advancing fast in Armenia and becoming one of its competitive advantages. These three knowledge sectors stand at the heart of knowledge-based economy (economic competitiveness) and knowledge-based society (reduction in poverty, social inclusion, civic engagement, civilizational advancement, etc.) that Armenia aspires to. Policy and strategy coordination will inevitably require changes in the governance of higher education, science and innovation within the national systems towards formally linking or uniting government bodies and national advisory bodies working in these areas.

Recommendations

R.1 Higher education governance and policy

R.1.1 Principles and strategic objectives

- R.1.1.1 Ensuring that *the principles* stated in the draft Education Development 2016-2025 State Programme of the Republic of Armenia and Armenia Development Strategy 2015-2025 are duly considered in the new Higher Education Strategy, in particular:
    - Inclusive and transparent policy making processes; social dialogue on higher education and research
    - Better policy integration between higher education, science and innovation; creation of a synergistic system of education, science and innovation; strengthening collaboration between higher education sector, science sector and industry, business and civil society
    - Higher education and research contributing to regional development
    - Strengthen monitoring and supervision mechanisms to improve transparency and accountability (education data management); introduce performance measurement
    - Strengthen internationalisation and international cooperation in higher education and research; aligning education and science systems with international standards and values, while respecting local needs and values.
- R.1.1.2 Further developing *the strategic objectives concerning higher education* stated in the draft Education Development 2016-2025 State Programme of the Republic of Armenia and Armenia Development Strategy 2015-2025 (for details see section 3.A.1).

R.1.2 Policy-making processes and relations to stakeholders

- R.1.2.1 Ensuring *open, transparent and inclusive policy-making processes* towards the new Higher Education Law, the new Higher Education Strategy 2016-2025 and beyond: the role, status and areas of activities of key stakeholder associations, such as the National Councils of Rectors and the National Students' Association, should be clearly marked in both processes; inclusion of all relevant ministries and governmental bodies should be ensured.
- R.1.2.2 Strengthening *coordination mechanisms of different aspects of higher education policy within the government*, i.e. between Ministry of Education and Science and its departments and the other relevant ministries, such as, for example, the Ministry of Economy, and their subunits.

- R.1.2.3 Formalising relations between the ministry and the key representative stakeholder associations (including national student association) to *establish corporatist relations between the state and the key representative associations*. This can be achieved by a way of regular formal meetings (minimal level of formalisation) or a national advisory body (such as, the National Youth Policy Council for youth policy), which would present the most institutionalised and formalised form of relations.

R.1.3 Governance and autonomy

- R.1.3.1 *Balance the presence and formal influence of government* in institutional government and management bodies with *targeted involvement of higher education beneficiaries (stakeholders)* in management of higher education institutions; *expansion of cooperation with external stakeholders/beneficiaries in educational and research processes*.
- R.1.3.2 Supporting development of *strategic management of higher education institutions* (possibly through external quality assurance and performance-based funding).
- R.1.3.3 Introducing and fully implementing and monitoring the application of legal provisions on *academic integrity and ethical behaviour* in all aspects of higher education and research.
- R.1.3.4 Ensuring the *independence of student associations* within higher education institutions and consolidating provisions which give students possibilities to participate in institutional governance and quality assurance structures and processes.

R.1.4 Licensing, accreditation and quality assurance

- R.1.4.1 Working towards ANQA's full membership in the European Association for Quality Assurance in Higher Education (ENQA) and registration in the European Quality Assurance Register for Higher Education (EQAR).
- R.1.4.2 Comprehensive development and implementation of the processes of *external evaluation* of the quality of higher educational institutions with *formative (developmental) purpose* and supporting internal systems of quality assurance at the higher education institutions.
- R.1.4.3 Introducing *a consolidated or a single legal status and legal code to govern higher education institutions*; also giving higher education institutions more freedom in terms of commercial operations.
- R.1.4.4 Specifying conditions for *university status and clarifying distinctions between different institutional types* (or streamlining institutional

types into fewer clearly distinguishable categories); making *licencing terms and requirements stricter*.

- R.1.4.5 Full implementation of the *national framework of qualifications* and development along with definition of *study programmes based on learning outcomes* (tuning methodology), and reorganisation and revision of study programmes to better match the recognised professions, labour market demands for skills and competences and developing human capital and knowledge in national strategically important areas.
- R.1.4.6 Timely and rigorous *accreditation and reaccreditation* of higher education institutions and study programmes.

R.1.5 Higher education and research data management system and knowledge to support policy-making

- R.1.5.1 Fully employing data from the *national integrated system for education data management* (supported by the World Bank) in policy making; adjusting reporting arrangements with higher education institutions in view of this new integrated education data management system. The type of data collected should be frequently reviewed as to ensure that structural changes in the system are reflected and also to develop linkages between higher education institutions' performance in education with that in research and in third mission.
- R.1.5.2 Supporting higher education institutions in developing their *institutional systems of data collection* for purposes of mandatory reporting, accreditation and quality assurance, and to support their own strategic management function and linking these institutional management information systems with the national integrated information system; ensuring ongoing software expansion and upgrades.
- R.1.5.3 Creating a publically-accessible *central knowledge repository* of all legal texts and policies, data on basic characteristics of all higher education institutions (including all study programmes offered) and analyses and studies on different aspects of higher education and science at ANQA or the Government's website.
- R.1.5.4 Strengthening the *Ministry's coordination, monitoring and evaluation of impact of the various projects by foreign donors*, which seek to analyse or intervene into higher education and science systems; ensuring that there is complementarity and coherence in purposes among these projects, to avoid repetition of efforts, to yield genuine added value and to allow for open knowledge sharing. This means that the various simultaneous initiatives are monitored not only by the funders, but also by the Ministry to ensure that projects achieve programme objectives as well as policy objectives set by the Government.

- R.1.5.5 Exploring options *to upgrade the Ministry's research capacities in the areas of higher education and research policy* either by building internal capacity in this area, or within ANQA, or outsourcing the task to a research unit within a university or research institute. A possibility to form *a regional research centre into higher education and research* could be explored in view of conducting applied research for Armenian policy making, offer consultancy services to higher education institutions and other stakeholders, and to conduct basic research. Such services could be extended to neighbouring countries where similar services are also performed mostly by foreign experts.

R.2 Structure of the higher education system

R.2.1 Higher education system efficiency

- *R.2.1.1 Fundamental review of the structure of higher education system* is needed in view of *reducing the number of higher education institutions and research institutes* (by mergers or accessions or other forms of formal cooperation), enabling and strengthening formal cooperation between research institutes and universities and providing for more even regional coverage of higher education institutions (which also have research function). Furthermore, uniting state organisations of similar scientific direction which work under various ministries; at least some of them can be moved under the universities or relevant scientific organizations. Concretely this implies the need for steering higher education institutions towards pooling (concentration) of resources and achieving economies of scale through mergers or other forms of formal cooperation. Such reforms require also that the structures of remuneration of academic and scientific staff are consolidated and that their career (progression) paths are streamlined.
- R.2.1.2 Continuing to apply diligently *licensing and accreditation procedures* for both public and private institutions as well as maintaining rigorous licencing, accreditation and quality assurance procedures for foreign higher education providers in Armenia and put these mechanisms in use towards more institutional and programmatic diversity and institutional profiling.
- R.2.1.3 Encouraging *institutional profiling and institutional positioning* whereby higher education institutions develop distinct missions and purposes based on their comparative advantages or areas of special national interest. The incentives for profiling and positioning typically come from performance-based funding and through QA and accreditation procedures.

R.2.2 Reform of study programmes

- R.2.2.1 *Reducing the number of study programmes to avoid duplication beyond healthy competition and to match recognised professions* to have sufficiently differentiated programmatic offer system-wide and to enable better aligning programmatic offer to labour market needs (see also below under funding).
- R.2.2.2 Preventing higher education institutions *from overspecialising the bachelor's programmes* but to structure them in a way to allow transition to master's programmes of other universities in related fields.
- R.2.2.3 Steering higher education institutions to making *a distinction in the programmatic offer* between the more academic study programmes and those that have stronger professional and vocational orientation as to allow students to make an informed choice matching their expectations.
- R.2.2.4 Supporting *programmatic profiling* at higher education institutions and promotion and *expansion of selected competitive and innovative study programmes*.
- R.2.2.5 Introduction of *new contemporary professions* with the purpose of imparting narrow specialization of study programmes at higher education institutions.
- R.2.2.6 Reorganisation and revision of study programmes to better match the recognised professions, labour market demands for skills and competences and developing human capital and knowledge in national strategically important areas. All study programmes need to be revised so as to be based on learning outcomes and in line with the national framework of qualifications.

R.3 Funding and access

R.3.1 Financing of higher education

- R.3.1.1 Reviewing different *models for long-term sustainable financing* of higher education in Armenia and finding appropriate balance between public and private funding of higher education institutions' operations in education, research and third mission (along the principle of diversification of funding sources).
- R.3.1.2 *Increasing public funding for higher education* when – in the long run - economic (and tax) circumstances improve. Consideration should be given whether some initial tax exemptions for universities' commercial activities might be a possible instrument to stimulate this function (while also ensuring that legal status allows all institutions to independently decide on this issue; i.e. status of foundations) or such incentives might be

possible to achieve other goals, such as steer restructuring towards mergers.

- R.3.1.3 *Remuneration of academic staff and researchers* needs to be reviewed and some general guidelines agreed on national level as to ensure that their remuneration is adequate for a middle-class standard of living (otherwise the best and the brightest will emigrate, choose other better-paying professions or have several simultaneous employments which impairs their quality of teaching and reduce their research). Funding programmes that acknowledge and promote individual scientists' research excellence are beneficial and need to be conducted transparently, with fair distribution across disciplines and with full involvement of scientific community in developing criteria of scientific excellence which need to match the disciplinary practices of scientific productivity.

R.3.2 Public funding of higher education institutions

- R.3.2.1 *Performance-based funding arrangements* for higher education institutions should be developed in a way that it creates incentive for higher education institutions to profile their educational, research and third mission offer. Performance indicators need to be defined in accordance to the institutional mission and profile and taking into consideration all three functions: education, research and third mission. Performance-based funding agreements should be implemented also for research institutes which offer study programmes along with performance indicators for research function.
- R.3.2.2 Reviewing the number of *publically-funded specialisations* to respond to the number of recognised professions, the labour market needs and national economic priorities. Targeting financing of study places to study programmes which are in priority areas for Armenia's development (as indicated in the Armenia Development Strategy).
- R.3.2.3 *Ensuring transparency in the funding relationship* between the government and higher education institutions.

R.3.3 Access

- R.3.3.1 Continuing to develop *student welfare support* (including student housing). A consideration should be given whether it would be possible to regulate (put a cap) on the maximum rent charges to students in private accommodation in Yerevan.
- R.3.3.2 Collecting *data on the social background of students* (and clearly define the underrepresented groups) and developing benchmarks on the participation of underrepresented groups in higher education.

- R.3.3.3 Ensuring affordability and accessibility of higher education for various social groups and persons with special educational needs.
- R.3.3.4 Reviewing the *national school leaving examinations* and the reports of systemic inappropriate private tutoring, cheating in final examinations (associated with inadequate invigilation), and narrow approaches to assessment which may increase the use of inappropriate private tutoring.
- R.3.3.5 Encourage higher education institutions to develop *outreach activities at secondary schools* (ideally by involving also employers) to inform students at secondary school about programme offer and organising educational (and informational) activities for secondary students at higher education institutions.
- R.3.3.6 Creation of *dormitories for foreign students*.

R.4 Education

R.4.1 Student centred approaches to teaching, learning and assessment

- R.4.1.1 Strengthening academic integrity and commitment to ethical behaviours in education processes.
- R.4.1.2 Initiating and supporting development and implementation of student centred approaches in teaching, learning and assessment.
- R.4.1.3 Initiating and supporting student involvement in research and innovation (in all cycles, including first cycle). A simple, yet effective instrument to stimulate such involvement is to require from all applicants for public research funding to demonstrate how research activities will be used in teaching and to show how students will be engaged in the funded research project.
- R.4.1.4 The actual teacher-student ratio on system and institutional levels needs to be calculated counting undergraduate and graduate Student Full-Time Equivalents (meaning student with full course-load) and counting Teaching Faculty Full-Time Equivalents. A rule of thumb recommendation is that such ration should not exceed 25 to 1, and a target at top universities tends to be around 16 to 1.

R.4.2 Reform of study programmes and partnerships with private sector

- R.4.2.1 *Reviewing of programmatic offer* at both bachelor's and master's level in view of reduction in number of highly specialised programmes, exploring possibilities of combining several programmes.

- R.4.2.2 *Review programmatic offer, admission numbers, graduation numbers and compare with the labour market needs* (measuring graduate employability per study programmes). Such data should be communicated through public relations campaigns by the government (or related agencies) and specifically to secondary school students (and their families) and should also be communicated to career planning activities and services in secondary schools.
- R.4.2.3 *Revising study programmes to achieve societal relevance*, develop discipline-specific learning outcomes, advance knowledge base and follow student-centred approach in teaching, learning and assessment.
- R.4.2.4 Developing more *broad-based study programmes* (by merging several existing ones) and *interdisciplinary programmes* which avoid early specialisation and to avoid duplication of courses offered by different departments in related study programmes. Such reorganisation does not necessarily mean reduction in numbers of teaching staff as size of student cohort per programme would increase, but do imply collaboration between teaching staff in curricular planning, course preparation and course offerings.
- R.4.2.5 *Partnerships between universities and the private sector* in terms of curriculum planning, arranging for internships and involvement of practitioners as visiting lecturers (or where appropriate as part-time lecturers) in education provision should be enhanced.

R.4.3 Organisation of academic work, remuneration and professional development of academic staff

- R.4.3.1 Organisation of work for academic staff should reflect the teaching, research and service functions as defined through the institution's mission and profile. In particular, *research function*, as well as knowledge transfer and other third mission activities, *need to be duly accounted for in work load, promotion criteria and remuneration* of academic staff at research universities (or any institution where research-based publications are part of promotion requirements).
- R.4.3.2 *Monitoring the distribution of academic staff* according to academic degrees and academic status along with gender and age distribution. A rule of thumb recommendation is that at least 40% of the permanent staff should have doctoral degrees, and at least 25% of the permanent faculty (defined as full-time) should be in the senior ranks (defined as a full or associate rank or equivalent). There should be representative gender balance at all levels of academic staff, including supervisory and management level. This should be achieved on the basis of an equal opportunity policy at recruitment and at the subsequent career stages without, however, taking precedence over quality and competence

criteria. Appropriate measures (through QA and performance agreements) should be developed to resolve imbalances.

- R.4.3.3 Academic staff is paramount resource of any higher education system. Therefore, careful *monitoring of the structure and dynamic in academic staff at system level, and conditions of academic work and remuneration on institutional level* is crucial. Consideration could be given to initiating national research projects into academic profession (such as, for example, research conducted within global research network on Conditions of Academic Work – CAP).
- R.4.3.4 There are pronounced *disparities in remuneration* of academic staff in Armenia. While higher education institutions have a full autonomy on academic staff matters, some *broad guidelines about terms and conditions of academic appointments, remuneration and contracts of academic staff* should be agreed among the higher education institutions, trade unions representing academic staff and the Ministry. Such guidelines should tackle questions, such as inequalities in salaries between academic ranks (senior professors versus junior academic staff); allocation of salary based on length of service or performance measures (research productivity, teaching quality, knowledge transfer) added; simultaneous teaching at multiple institutions, etc. This is to ensure that academic staff in Armenia can enjoy a middle-class lifestyle without having to simultaneously work multiple jobs, which is detrimental to quality of teaching and to research (and third mission activities). The health of academic profession is critical for the future of higher education system.
- R.4.3.5 Continuation and strengthening of *social programmes to support young academic staff (and young researchers)*; such as the one set by the government to help young academic staff access subsidies housing and subsidies home loans (and ensuring that these provisions are distributed in fair and transparent manner). In particular young academic staff and researchers often do not earn enough for a modest middle-class standard of living, which is a rule of thumb criteria for adequate remuneration (see Altbach et al. 2012).[6]
- R.4.3.6 *Revision of the organisation of workload, career paths and remuneration* of the academic staff affected by institutional mergers or formal cooperation among higher education institutions, among research institutes and between higher education institutions and research institutes.
- R.4.3.7 Initiating and supporting *system-wide professional development activities* for academic staff to improve quality of teaching, learning and

[6] Altbach, P.G., L. Reisberg, M. Yudkevich, G. Androushchak, and I. F. Pacheco (2012) *Paying the Professoriate: A Global Comparison of Compensation and Contracts*. New York: Routledge.

assessment (e.g. training programmes, workshops, exchange of best practices, public acknowledgement of innovation in teaching) and possibly introduction of certificates for teaching in higher education (for all new teaching staff and recertification for all teaching staff in regular intervals.

- R.4.3.8 *Employment contracts* for academic staff should be developed in a way to ensure that the performance of academic staff is not undermined by instability of employment contracts.
- R.4.3.9 Ensure that academic staff and researchers are provided with working conditions which allows both men and women to balance family and work; in particular, attention should be given to flexible working hours, part-time working, tele-working and sabbatical leaves. For academic staff who have taken childcare leave, such absences should be taken into account in decisions on promotion (i.e. the clock stops for the period of childcare absence).
- R.4.3.10 Introducing system for evaluation/appraisal of professional performance of all academic staff (including senior professors), on a regular basis and in a transparent manner by an independent committee.

R.4.4 Internationalisation of education provision

- R.4.4.1 Introducing *internationalisation strategy* as part of the new Higher Education Strategy.
- R.4.4.2 Initiating and supporting institutions in *developing specific institutional profile* concerning their educational offer; i.e. select specific study programmes to be offered in foreign languages to attract foreign students.
- R.4.4.3 Fostering *foreign language teaching*, *teaching in foreign languages* and possibilities for students to prepare their theses and dissertations in a foreign language.
- R.4.4.4 Fostering *internationalisation of curricula*; curricular reform to account for global knowledge.
- R.4.4.5 Using *ICT in internationalisation of education provision* (e.g. use of MOOCs aside of local teaching).
- R.4.4.6 Supporting *expansion of student and staff short-term mobility*.
- R.4.4.7 Enabling and supporting *joint courses and joint and double degree programmes* with other institutions at home and abroad.

R.5 Research

R.5.1 Organisation of research at universities

- R.5.1.1 *Strengthening research function at universities* across disciplines and departments, ensuring that education function at universities is accompanied with research and that research supports teaching. To achieve this various measures of restructuring of higher education institutions could be considered, such as merging departments, mergers of university units with research institutes (of similar scientific direction) or other formal cooperation of research institutes and universities (for example, creating joint research labs or centres). The goal is to achieve concentration of research resources and facilities at universities, and creating possibilities for interdisciplinary research.
- R.5.1.2 Strengthen *post-graduate education at universities* and *post-doctoral courses*; when appropriate joint doctoral programmes between higher education institution and research institute or through institutional mergers. Again, formal links between universities and research institutes can help to achieve this goal. At the same time *post-graduate students can assist with teaching and supervision* (as teaching fellows) of undergraduate students.
- R.5.1.3 Organisation of a *technological research university* (as, for, example Massachusetts Institute of Technology) by merging the existing technological universities or by creating a formal network/consortium of technological universities.
- R.5.1.4 *Increasing funding* for research, and support to universities for diversifying funding sources to support their research activity.
- R.5.1.5 Strengthening programmes for funding *institutional research excellence* (centres of excellence) along *with individual scientists' research excellence*.
- R.5.1.6 Strengthening funding programmes for *young researchers*; i.e. competitive research funding for postdoctoral researchers, where they can apply without senior researchers.
- R.5.1.7 Ensuring stable growth of researchers in scientific and technical fields.

R.5.2 Research environment at universities

- R.5.2.1 *Upgrading material and infrastructure base* of research activities at universities.
- R.5.2.2 Enhancing *effectiveness of research* in universities.
- R.5.2.3 Identifying *specific research priorities*, institutional research profiles, centres of research excellence.

- R.5.2.4 Aiming towards *integration of education and research*.

R.5.3 Researchers' work, status and remuneration

- R.5.3.1 Developing *a charter for researchers and code for researchers* (possibly following the European Charter for Researchers),[7] which the roles, responsibilities and entitlements of researchers as well as of employers and/or funders of researchers.
- R.5.3.2 Having clearly developed and fully implemented *ethical principles in conducting research*.
- R.5.3.3 Enabling *mobility of researchers* as a means of professional development.
- R.5.3.4 Developing *a clear career path for researchers* within universities: full-time researchers and those that combine research function with teaching.
- R.5.3.5 Ensuring that researchers (and academic staff) are provided with working conditions which allows both men and women researchers *to balance family and work*; in particular, attention should be given to flexible working hours, part-time working, tele-working and sabbatical leaves. For researchers who have taken childcare leave, such absences should be taken into account in promotion and in applications for research funding (i.e. the clock stops for the period of childcare absence).
- R.5.3.6 Introducing system for *evaluation/appraisal of professional performance* of all researchers (including senior researchers), on a regular basis and in a transparent manner by an independent committee. Such system should be linked to promotion policies and remuneration.

R.5.4 Doctoral studies

- R.5.4.1 Further developing doctoral programmes (the organised set of selected taught courses and research opportunities within one or more disciplines); taking into consideration that the primary goal of doctoral education is research training through individual research experience (and should not be viewed as another study level although there is taught course component in such programmes); allowing for interdisciplinarity, transferable skills and mobility (EUA 2010).[8]

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[7] http://ec.europa.eu/euraxess/index.cfm/rights/europeanCharter

[8] European University Association (EUA) (2010) Salzburg II recommendations: European Universities' Achievements since 2005 in Implementing the Salzburg Principles. http://www.eua.be/Libraries/publications-homepage-list/Salzburg_II_Recommendations.pdf?sfvrsn=0

- R.5.4.2 Ensuring that supervisors of doctoral candidates have sufficient time, expertise and commitment to work with doctoral candidates. Appropriate remuneration for supervision work should be considered to ensure sufficient involvement. At the same time, a clear code of conduct needs to be established which protects doctoral candidates from too large teaching workload (on behalf of their supervisors or otherwise) and that teaching duties are adequately remunerated.
- R.5.4.3 Ensuring that doctoral candidates also develop transferable skills and have career developing opportunities for networking within research sector and in non-academic sectors.
- R.5.4.4 Creating possibilities for mobility of doctoral candidates through EU programmes or bilateral cooperation.
- R.5.4.4 Increasing stipends for doctoral students for maintenance and ensuring that doctoral candidates enjoy adequate social security coverage.
- R.5.4.5 Considering development of doctoral schools.
- R.5.4.6 Creating supportive conditions for employment of PhD holders outside academia (e.g. through tax incentives to private enterprises).

R.5.5 Internationalisation of research activity at universities

- R.5.5.1 Considerably expanding international cooperation in the field of research at universities (and beyond).
- R.5.5.2 Enabling and supporting research mobility.

R.6 Third mission: knowledge transfer, innovation, entrepreneurship and outreach

R.6.1 Partnership between universities and industry, business and non-profit organisations

- R.6.1.1 *Strengthening the partnerships* between universities and relevant research institutes with industry/businesses and non-profit organisations (such as cultural institutions) by a combination of activities that may include:
    - direct funding of research costs through contracts and grants;
    - formal licensing to industry of university-owned patents and technology;
    - university-industry exchange programs and student internships;
    - specialized programs designed by the university for continuing education and training of professionals;

- participation of industry representatives in university governance and advisory groups;
- cooperative research projects;
- use of unique university facilities on a fee-for-service basis;
- research and development facilities of industries housed on university property industrial parks;
- academic staff and researchers' consulting activities and expert services.

- R.6.1.2 Universities should not only partner with business entities, but also with cultural and other civils society organisations, such as cultural institutions in other to contribute to social and cultural development on pair with economic development.

R.6.2 Strengthening knowledge transfer and commercialisation of research

- R.6.2.1 Strengthening conditions and mechanisms for knowledge and technology transfer between public research and the surrounding society (also in view of regional development), such as departmental support structures, consultancy services, seed funding opportunities and entrepreneurship education and networking opportunities.
- R.6.2.2 Fostering commercialisation of research results from public research institutions should be improved.
- R.6.2.3 Developing innovation-support infrastructure
- R.6.2.4 Revising regulations to stimulate and support the creation of spin-off companies at universities.
- R.6.2.5 Addressing intellectual property ownership issues, especially intellectual property created as a result of government financing.
- R.6.2.6 Ensuring that researchers at all career stages reap the benefits of the exploitation (if any) of their R&D results through legal protection and, in particular, through appropriate protection of Intellectual Property Rights, including copyrights.

R.6.3 Entrepreneurship education

- R.6.3.1 Informing students about entrepreneurship as an alternative career path and *entrepreneurship education should be integrated into the student career services* at higher education institutions.
- R.6.3.2 *Interdisciplinary study programmes* lend themselves particularly suitable for including entrepreneurship education in the curriculum.

However, entrepreneurship education should not be confined only to specific disciplines which naturally address the questions of entrepreneurship, but to students from all disciplines.

- R.6.3.3 Setting up *entrepreneurship centres* at universities to allow students to work in teams on real-world projects; linked to research and innovation centres.

R.6.4 Outreach to primary and secondary schools and general public

- R.6.4.1 Fostering outreach activities for primary and secondary schools and for general public.
- R.6.4.2 Supporting events and initiatives that popularize science by a way of "Science week", "Art Week", "Entrepreneurship Week", when higher education institutions hold open days and targeted events (e.g. workshops) for pupils and general public.
- R.6.4.3 Supporting events (such as lecture series) which are open to the public.

1. Introduction

Higher education is seen as key driver of development and growth in knowledge-based economies. It is intertwined with science and innovation and together these triplet knowledge policy areas address multiplicity of economic and societal challenges, such as economic growth, regional development, the environmental sustainability and social and cultural development. Higher education is also associated with personal social and economic benefits and higher social status. Higher education graduates are usually not only more likely to find jobs, earn higher salaries, but also are more likely to be more engaged in civil society, more interested in public affairs and are better at taking care of their health. These observations also hold true in Armenia.

Armenia is a lower-middle-income country with a small population of about 3 million, a challenging (land-locked) geo-political location in the south Caucasus region (closed borders with Azerbaijan and Turkey out of four of Armenia's neighbouring countries) and limited natural resources. Economically, Armenia is connected especially to the Russian and the European markets, and accordingly its economy is sensitive to and affected by economic developments in these regions; such the current economic slowdown in the Russian Federation and the weak demand growth in the European Union. Retention of talent is one of Armenia's major challenges along with unemployment (17.2% and youth unemployment at 24%), high informal employment, and eradication of poverty (30% of the population lives below the poverty line).

With globalisation, national economies have less control and influence over the provision jobs and are more subject to global capital – labour relations including the global circulation of talent. Armenia continues to show negative migration patterns (-5.8 migrants/1000 population estimated for 2015). As a lower middle-income country, Armenia is struggling to move from brain drain to brain circulation. Retention of talent is one of its major challenges and attraction of foreign talent one of the aspirations. Armenia has to be prepared for increasing weakening of economic and political borders, which enable students to seek more easily education provision abroad and also to enable foreign students to come more easily to seek education provision in Armenia; where employers can hire graduates educated abroad, companies can more easily buy foreign research and development, and researchers are more mobile. Globalisation as a process needs to be followed by internationalisation, where government and other stakeholders deliberately and systematically adopt their structures, processes and practices to deal with the challenges and opportunities globalisation. Globalisation brings to lower-middle-income countries such as Armenia challenge of brain drain as it is easier to find study and work opportunities abroad. At the same time globalisation creates imperatives to shape own research and higher education

to keep the talent and attract new talent. Economic recovery, naturally, plays a crucial role in this process. However, modernised higher education and research at the same time benefit from economic development and are part of the solution to drive economic development.

Armenians traditionally hold high regard for education and training and families go out of their way to enable schooling and higher education of their children. Higher education degree continues to bring private benefits to individuals: those with higher education degree are less likely to be unemployed and are expected to earn higher salaries. However, although obtaining higher education degree continues to improve chances to find employment and have higher earnings (OECD, 2014),[9] there is no assurance to such effect. Tertiary education degree in Armenia makes it likelier to find employment, but not to the same extend as this is the case in some other European countries. In 2014, from all unemployed (242.1 in 1000 persons) 31% had tertiary, postgraduate education. Among all unemployed males, 28% were those with higher education whereas in case of female unemployment, 34% of all unemployed females had tertiary, postgraduate education. Unlike European countries where higher levels of education improve women's' employment prospects, this is less the case in Armenia: in Armenia, women with tertiary degree are less likely than men with tertiary degree to find employment (European Commission/EACEA/Eurydice, 2015, 187).[10]

Caution should be applied in understanding human capital theories which conceive individuals as being able to succeed in obtaining employment and achieving a particular social status solely on the basis of their abilities and power of application as though other factors, such as social class, cultural, social and financial capital did not play a role (Marginson, 2015). As Marginson (2015, 4-5) points out: "*Students and graduates, educational institutions, professions and employers make often-strenuous efforts to bring education and work together. However, the transition between the two sites is also fraught. Their alignment is partial and unclear. Relations are multiple, context-bound, fragmented, uneven and must be continually worked on.*"

Furthermore, in the World Economic Forum's Human Capital Index (2015), Armenia is featured among top ten countries with the largest share of inactive tertiary-educated people (228,500 total number of tertiary-educated inactive people, which is 23.9% of all tertiary educated people and 8% of total population).[11] It is of importance that the traditionally high regard for education continues to be nurtured even in times of economic downturn when

[9] The Organisation for Economic Cooperation and Development (OECD) (2014) Education at a Glance 2014. OECD Indicators. OECD Publishing. http://www.oecd.org/edu/Education-at-a-Glance-2014.pdf

[10] European Commission/EACEA/Eurydice (2015) The European Higher Education Area in 2015: Bologna Process Implementation Report. Luxembourg: Publications Office of the European Union.

[11] World Economic Forum (2015a) *Employment, Skills and Human Capital Global Challenge Insight Report: The Human Capital Report 2015* (in collaboration with Mercer).

unemployment among graduates is particularly high. One way to do so is to collectively work towards better connection between the higher education sector and the labour market to ensure a match between the economy's demand for skills and the graduates' learning outcomes. In time of economic downturn it is also important to ensure that investment into education and research in sectors, such as arts and humanities and social sciences are not neglected and that these to relate better to the needs of the professions they are preparing students for. There are a number of ways to improve these connections as it will be discussed later.

The Armenian Development Strategy (2015-2025) addresses these areas, while it also emphasizes human capital development – through education and science - as one of the countries' priorities to achieve sustainable development. The expectations, thus, run high for higher education sector to contribute to the economic development of Armenia by unleashing human capital – "the skills and capacities that reside in people and that are put to productive use" (World Economic Forum and Mercer, 2015, 3)[12] - by creating knowledge, transmitting and exchanging knowledge with industry, by translating and bringing knowledge to use; and by supporting the entrepreneurial culture of Armenian business sector , including the small and medium sized enterprises (SMEs). Education establishments, including higher education institutions and research institutes, are seen to play an important role in building the social infrastructures that could help economic development of regions (*marzes*) and thus support more balanced regional development. Higher education is also seen as a crucial element in curbing inequality provided that high quality education is accessible for all members of society (and diaspora) and is inclusive in terms of attainment and learning outcomes. The Armenian Development Strategy presents a number of objectives both in the area of education, including higher education and in science (research). One of the significant recent reforms in the field of education has been – after passing the law in 2015 - to extend free compulsory education from nine to twelve years to include either a complete secondary education or an intermediate professional education.

In the area of higher education ample reforms have been undertaken following Armenia's joining the Bologna Process (towards the establishment of the European Higher Education Area – EHEA) in 2005. The main Bologna recommendations have already been fully or to a large extent implemented:

a) introduction of the three-level qualification system,

[12] World Economic Forum and Mercer (2015) *Employment, Skills and Human Capital Global Challenge Insight Report: The Human Capital Report 2015.*

b) introduction of the system of accumulation and transfer of academic credits at higher educational establishments in line with the European credit transfer system (ECTS),

c) establishment of the national system for professional education quality assessment and assurance in line with European standards,

d) adoption of the national framework of education qualifications in line with European qualification framework,

e) creation and implementation of the mobility organization system for students, academic staff and graduates,

f) introduction of the system for cross-recognition of qualifications, diplomas and learning outcomes, and

g) expansion of students' participation in academic and management processes of higher educational establishments.

Despite many achievements, there still a number of challenges in implementation of Bologna recommendations, especially in the development of comprehensive quality assurance systems at system and institutional levels; development of double and joint degree programmes; definition of learning outcomes (as per "tuning" methodology) for study programmes in all three cycles and full operation of national qualifications framework; general strengthening of quality of education provision and implementation of student-centred learning, teaching and assessment; etc. (for more details see Matei, Iwinska and Geven, 2013).[13] Higher education reforms held political limelight over the past three years also due to Armenia hosting the Bologna Secretariat, and 2015 Bologna Ministerial Summit, both of which were widely acknowledged as successful.

The EHEA continues to provide policy recommendation for higher education reforms in Armenia, bit it is not the only source from which policy recommendations are diffused into Armenian national policy arena. Armenia also participates in the Eastern Partnership (EaP), which is a joint initiative involving the European Union (EU), its member states and 6 eastern European partners: Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine. Since 2009, the Eastern Partnership presents another layer of intergovernmental regional policy cooperation (and potentially policy coordination), which is accompanied by the EU assistance through the European Neighbourhood Instrument. This instrument includes cooperation in higher education and research through the platform "people to people

[13] Liviu Matei, Julia Iwinska (Central European University, Budapest) and Koen Geven (European University Institute, Florence) (2013) Higher Education in Armenia Today: a focused review Report for the Open Society Foundation Armenia. Budapest: CEU Higher Education Observatory. http://www.osf.am/wp-content/uploads/2013/11/OSF_HE_report.pdf

contacts". The European Neighbourhood Instrument can be combined with EU programmes supporting education and research. For example, in 2014-2015, there were 29 projects funded through TEMPUS Programme, out of which 8 were coordinated by local institutions. Armenia also participated in Erasmus Mundus and Erasmus+ Programme (European Commission, 2015).[14] More possibilities for cooperation in science will emerge from the agreement reached in December 2015 (and signed in January 2016) between the Armenian Government and the European Union for Armenia to participate in the European Union's Horizon 2020 programme.

Also, in 2015 Armenia joined the Eurasian Economic Union (with Russian Federation, Belarus, Kazakhstan and Kyrgyzstan), which is in the long run also likely to develop regional cooperation initiatives in the areas of higher education and research; thus building on the widespread existing informal ties by individual academics and researchers and the inter-institutional ties continuing from the times of the Soviet Union. The Eurasian Economic Union has already adopted a mutual recognition of qualifications. There is also a Eurasian University Network in the making.

Furthermore, there are ample interventions in the national system through projects supported by various international organisations, especially the World Bank, UNESCO, Open Society Foundations, Council of Europe and the European Union (as mentioned above). One challenge is to ensure that all of these interventions are properly coordinated, monitored and evaluated by the Armenian government so as to ensure that there is complementarity and coherence in purposes among these interventions, to avoid repetition of efforts, and to yield genuine added value aligned with the Armenian government's policy objectives.

Economic changes have brought about emergence of knowledge-based economic systems, which rely on knowledge-intensive industry and business, and are embedded in global economy. As it significance for the social and economic development is also being affirmed by public authorities, their demands on what higher education sector should deliver in terms of human capital and usable knowledge are becoming more specific and wide-ranging. For countries with small domestic markets, such as Armenia, trade liberalisation is particularly relevant, and it calls for export orientation of domestic industry. Internationalisation of higher education through student and staff mobility, education exports and internationalisation of curricula play an important role here as they prepare graduates for working in globalised economy. Equally, international cooperation in research allows countries to stay up-to-date with and contribute to the latest developments in science.

[14] European Commission (2015) Joint staff working document: Implementation of the European Neighbourhood Policy in Armenia. Progress in 2014 and recommendations for actions. Brussels, 25.3.2015, SWD(2015) 63 final

To fulfil public expectations and strengthen it societal impact, the Armenian higher education sector needs upgrading. For a variety of reasons, Armenian higher education is now at a point of transition: the number of people entering the system is growing and the profile of students is changing. Unemployment and changing patterns of work bring new urgency and a much greater emphasis on lifelong learning and upskilling. A high proportion of the skills that is needed now in the workforce are high-order knowledge-based skills, many of which can be acquired only in higher education institutions. The importance of high quality research to the teaching mission and to underpinning socio-economic development has grown significantly over the past decade and will continue to do so over the next decade. There is a dire need to transform the higher education landscape in Armenia, to widen participation to include those previously excluded, to leverage the traditionally high value the government places on education, to get ready for the job opportunities that will come with economic recovery, and to deliver knowledge and learning of lasting social significance.

The impressive development of information and communication technologies (ICTs) in the country, which has rejuvenated the Armenian business and which has a promise to drive longer-term growth, lends itself an important mechanism in modernising other industries, and could play a similar role in higher education. Digital technologies enable that several types of work – including in education provision and research - can be performed in virtual marketplace or different parts of the work package are virtually assembled and then seamlessly delivered to the origin of the request anywhere in the world. Development in Information and Communication Technologies (ICTs) bring about changes in modes and methods of educational processes, which enable students to participate in higher education also through long-distance programmes or through massive open on-line courses (MOOCs). ICT is changing teaching and learning, making it more accessible and more personalised, and it is also changing the higher education organisational and business models. ICTs are particularly relevant for small peripherally-located systems – such as Armenia -, as they remove the spatial boundaries and enable global exchange of ideas, information and services.

At this important turning point, and to pave the way for a new strategy, a feasibility study is needed to assess the current situation in the Armenia. The present study works under the assumption that the existing funding circumstances of higher education and research in Armenia will not change dramatically – either way – in the immediate future and that upgrading of the system needs to happen within the existing scope of funding.

The feasibility study is prepared with belief that higher education sector in Armenia can improve its societal impact despite the fact that economic recovery is not yet expected and that in a short-run a significant increase in public funding of higher education and research may not be possible.

With this in mind, the study is guided by the following research questions:

1. *What are the capabilities of the Armenian higher education system and how these are influenced by major trends and (internal and external) developments? What are the key strengths (comparative advantages) and weaknesses of the system in terms of capabilities?*

2. *How does the Armenian Higher Education (HE) system perform in the areas of higher education, research, innovation and entrepreneurships? How does its performance compare to other systems in the region? What are the key strengths (comparative advantages) and weaknesses (underperformance) of the system performance?*

3. *What issues should be specifically addressed by the new Higher Education Strategy 2016-2025 and how?*

2. Methodology

The intent of the feasibility study is to assess the capabilities and performance of the higher education system in Armenia to contribute to social and economic development. The study aims to identify the key strengths and deficiencies of the system and to offer recommendations to be considered in the preparation of the new Higher Education Strategy 2016-2025. The feasibility study seeks to perform a comprehensive review of the system paying particular attention to the cross-sectorial nature of higher education and the mutual interdependencies between higher education sector with research and innovation sectors.

The feasibility study has been prepared under the assumption that any future reforms in higher education need to be undertaken in the short run within the existing scope of public funding. In other words, the reforms are sought for the higher education sector to do more and better with existing scope of public funding. Therefore, the questions of optimisation of cost and pooling of resources to achieve economies of scale and concentration of resources need for excellence in research are particularly emphasised. As it is the case in all complex systems, reforms in higher education require simultaneous changes of multiple factors to achieve improved efficiency and quality of the sector.

The analysis in this study rests on six main areas, which also present the main structure of the report:

1) Higher education governance and policy making covers first the questions of relations between the state and higher education institutions, in particular higher education steering through legal, policy and regulatory mechanisms (including licensing, quality assurance and accreditation) and institutional autonomy. Second, the principles and rules concerning policy-making processes are addressed here including the involvement of stakeholders in policy-making and the availability of evidence to support policy-making.

2) Structure of higher education system is concerned with question of number and diversity of higher education institutions, the horizontal (functional links) between higher education, research, and innovation systems and possibilities to integrate the different parts into one Armenian knowledge system.

3) Funding and access addresses the sustainability of financing of higher education, the distribution mechanisms for public funding to higher education institutions and the questions of access to higher education and student social welfare.

4) Education is the primary function of the higher education sector and as such at the core of the feasibility study. This area covers the organisation and reforms of study programmes, quality of teaching, learning and assessment; internationalisation of education provision and the organisation and conditions of academic work.

5) Research area addresses the research function within higher education sector, conditions of research work at higher education institutions and internationalisation of research.

6) Third mission (knowledge transfer, innovation, entrepreneurship and outreach) area focuses on relations between higher education sector and industry, business and non-profit sectors as well as conditions for strengthening knowledge transfer and commercialisation of research. It also looks into entrepreneurship education and links between higher education and SMEs as well as outreach of higher education institutions to secondary and primary schools.

Capabilities of the higher education system

M.1 Higher education governance and policy

M.1.1 The role, purpose and meaning of higher education in Armenia (values and policy goals)

OBJECTIVES: set clear goals as to the societal role and impact of higher education and research; align with related policy strategies (development strategy, education strategy, research/science strategy)

a. What role is envisaged for higher education in relation to economy, society and ecology?

b. What are the distinct contributions of higher education to economy, society and ecology?

c. How do the higher education objectives relate to the broader political goals and policies and strategies in related areas?

d. How do the higher education objectives relate to national and global higher education trends and economic and social developments?

e. How do the higher education goals interact with the objectives of the Bologna Process?

M.1.2 Higher education governance: structures and processes

OBJECTIVES: ensure coordination of the new legislative reform with strategy; ensure horizontal coordination of higher education and research and innovation strategies; create formal pathways of coordination/integration of higher education and research and innovation governance and system steering; ensure formal involvement of relevant stakeholders in policy-making

f. What are the key higher education system governance structures, i.e. key bodies within the government responsible for higher education, advisory bodies to the government, which are the national stakeholder associations?

g. How are governing structures from related sectors (research/science, innovation) linked to the higher education governance?

h. What are mechanisms for policy convergence and policy integration between the higher education, science and innovation sectors?

i. What are the mechanisms for involvement of national stakeholder associations in higher education policy-making (rectors' conferences, student unions, teacher/researcher associations, chamber of commerce?

M.1.3 What are the key government steering mechanisms in relation to higher education sector?

OBJECTIVES: effective use of legal and regulatory texts, funding mechanisms and accreditation, licensing and quality assurance for system steering towards more efficiency and quality

j. What is the existing legal and regulatory framework? Are various legal and regulatory texts consistent; are they relevant for contemporary higher education circumstances?
k. How does government use funding as steering mechanism?
l. How does government use licencing, accreditation and quality assurance as steering mechanisms?
m. What is the level of institutional autonomy of higher education institutions?

M.1.4 Monitoring and measuring higher education system performance (societal impact and contribution)

OBJECTIVES: education data management; data collection systems on key operations, performance and societal impact of higher education institutions; knowledge production and empirical evidence for policy-making; research capacity on (higher) education policies

n. How is performance and societal impact (social accountability) in higher education, research, and innovation monitored and measured at the system-level?

o. What kind of system/systems of data collection exists/exist at the government level? Is data collected into one central and integrated system (data warehouse) or several centralised, but not integrated systems?

p. How institutions are assisted/supported/guided in terms of data collection on main operational work flows?

q. What are the main initiatives to align statistical data collection systems with the international standards/systems (Eurostat, OECD, etc.)?

r. How is higher education researched at government level, how is knowledge produced and intelligence on higher education system developed, how is evidence for policy-making obtained?

s. How is data used as evidence in national higher education strategies?

M.2 Structure of the higher education system

M.2.1 Higher education system efficiency

OBJECTIVES: clarify the desired model of system differentiation and identify policy instruments to achieve this (funding, QA and accreditation, licensing); identify policy instruments to steer institutional profiling

a. What type of higher education system exists: unitary, binary? What are the types of higher education institutions?

b. What is the distribution of higher education institutions per ownership (public vs. private)?

c. What is the desirable number of institutions, their local branches and programmes?

d. Are the distinctions between the different organisational types (their purpose, orientation, PROFILE) of higher education institutions clear? What mechanisms/policy instruments ensure/stimulate institutional profiling and system differentiation?

e. Are there initiatives towards institutional mergers or joint programmes or other joint structures (i.e. research centres) (within the local-regions, national system or internationally)? Are there other possibilities for intra-institutional cooperation in teaching and research?

f. Specifically, what models of intra-institutional cooperation would be acceptable/possible between the higher education institutions and the various institutes within the Academy of Sciences?

g. Are there possibilities for regional or discipline clusters in terms of programme, research and resource sharing?

h. What is the desired model of system differentiation in Armenia: concentrated hierarchical (vertical) or decentralised flat (horizontal differentiation?

M.2.2 Study programmes

OBJECTIVES: to link study programmes to recognised professions, make them more-broad based, interdisciplinary and thus allow more permeability between programmatic offers at different cycles; prevent overspecialisation at Bachelor's level

i. Are the distinctions between academically-oriented and vocationally-oriented study programmes clear to students?

j. What mechanisms/policy instruments ensure/stimulate functional (programmatic) differentiation?

M.3 Funding and access

OBJECTIVES: to achieve sustainable financing of higher education sector, accountability for public funding, and equity of access;

M.3.1 System funding

a. What approach is Armenian taking or should take to achieve long-term financial sustainability of higher education (e.g. general increase in taxation or more effective tax collection to narrow the funding gap; student fees, supported by student loans; a graduate tax; employer contribution)?

b. Does current system need change to allow for more equity in access?

c. What is the total amount of funding for higher education sector and the share of public funding of higher education and research? [% of GDP, compared to EU21 average of 1.4%]

d. What is the % of state budget appropriations for higher education; total amount of direct state funding for higher education institutions and amount of competitive public research funding?

M.3.2 Public funding of higher education institutions

e. What is the current funding model of higher education institutions? Does it help reaching objectives? Have other funding formulas (i.e. performance-based funding) been considered?

f. How are funding streams diversified in higher education and research sectors?

g. What are the main system-wide research funding bodies?

M.3.3 Student social welfare and access

h. How does the share of private contribution for funding of higher education reflect on access to higher education and educational equity?

i. What types of student social support measures exists?

j. How is the transition from secondary schooling organised?

M.4 Education

OBJECTIVES: to achieve quality and equity in education provision across the higher education system; to ensure aligning of education provision with needs to the labour market and broader societal and cultural objectives

M.4.1 Content of study programmes and curricular reforms

a. Are learning outcomes defined for all programmes at all cycles?

b. Has national qualifications framework been fully implemented?

c. Are all study programmes accredited? Is there scope for accreditation of broad-based and interdisciplinary programmes? How often are they reaccredited?

d. How does educational offer respond (and monitor) the labour market and skill needs?

e. Do broad-based/interdisciplinary programmes (e.g. linked courses, learning clusters, and coordinated studies) exist?

f. What is the involvement of industry and business in curriculum planning and design? How is that promoted?

g. Are there incentives for business/industry to accept inters?

h. How is entrepreneurship education included into programmatic offer?

i. How is education for democratic citizenship practiced within higher education institutions?

j. Is there programmatic profiling/profiling of education provision?

M.4.2 Quality of teaching, learning and assessment; student centred approaches

OBJECTIVES: to strengthen quality of teaching, learning and assessment; ensure teaching is appropriately assessed, measured and rewarded; to promote innovation in teaching, learning and assessment

k. Is there a national body coordinating and measuring quality of teaching and learning? Is there a national body to offer training, certification or otherwise support teaching function at higher education institutions?

l. What are measures taken at system level and in institutions for advancing quality of teaching, learning and assessment?

m. How is quality of teaching and learning assessed and measured at institutional level?

n. What are specific measures to assess learning gains, i.e. direct measures of learning outcomes within study programmes?

o. Are there any specific measures to promote innovation in teaching, learning and assessment?

M.4.3 Conditions of academic work and academic profession

OBJECTIVES: to provide good working conditions and status of academic staff

p. How is academic work load specified? Does it account for research and third mission activities?

q. What is the distribution of academic staff within institutions according to rank, gender, age?

r. How is remuneration of academic staff regulated? Do academic staff earn enough to enjoy middle class lifestyle? How do the top-level salaries of academic staff compare to other professions? How do salaries of junior academic staff compare to senior? What other sources of remuneration academic staff can earn next to the base salary (rewards, bonuses, allowances)?

s. How wide-spread is the practice of simultaneous teaching at several institutions? Are there any specific provisions regulating simultaneous teaching at several institutions?

t. What are practices for hiring into academic position? Is there academic inbreeding?

u. What is the share of full-time academic staff compared to part-time?

v. Is there professional development available for academic staff, for example to improve teaching?

M.4.4 Internationalisation of education

OBJECTIVES: strengthening internationalisation in education; further developing education exports (attracting foreign students); strategically engaging diaspora in internationalisation initiatives; using ICT in internationalisation of education; foreign language learning and teaching

w. What are the key objectives in internationalisation of education? How are these linked to profiling of institutions?

x. What is the extent of education exports?

y. How diaspora is involved and could be involved in internationalisation initiatives?

z. How can ICT be used in internationalisation?

aa. What is the level of foreign language learning?

M.5 Research

M.5.1 Quality of research sector

OBJECTIVES: to achieve quality in research function at universities; to profile research at universities and identify globally competitive research fields; to provide good working conditions and status of researchers

a. How is research policy coordinated and evaluated?

b. What is the extent of research activity/output from the university sector compared to other research-intensive institutions?

c. What is the volume and quality of research across disciplines? Are nay disciplined underdeveloped?

d. How is public funding of research coordinated? What are the various funding streams for research in the university sector?

e. How are doctoral students supported?

f. Is there funding available for postdoctoral researchers at universities?

g. Are there incentives (e.g. tax incentives) for business/industry to collaborate with higher education/research institutes on projects or for hiring PhDs?

M.5.2 Internationalisation of research

OBJECTIVES: strengthening internationalisation in research; strengthening international research collaboration; supporting researchers in finding information on foreign research funding, in preparing applications and seeking research partners; strategically engaging diaspora in international research collaboration

h. What are the key objectives in internationalisation of research? How are these linked to profiling of institutions?

i. What is the level of international collaboration in research?

j. What is the level of research output in internationalisation perspective (number of joint publications with foreign collaborators, publications in international journals and publishing houses)?

k. How diaspora is involved and could be involved in internationalisation initiatives?

l. How successful are Armenian researchers in obtaining foreign research funding? What are the main sources of this funding?

M.6 Third mission: knowledge transfer, innovation, entrepreneurship and outreach

M.6.1 Societal impact of higher education, social and economic benefits

OBJECTIVES: to strengthen societal impact of higher education in industry and business and through social innovation

a. To what extent does higher education legislation steer the structure of higher education system and provision of education in each institution?

b. What are key legislative provisions in terms of fields and programmatic offer?

c. How often are national higher education and research strategies adopted?

M.6.2 Innovation and entrepreneurship

OBJECTIVES: to improve access to publically-funded research and development (R&D), including and especially to entrepreneurs and small and medium sized enterprises (SMEs); to allow for early and inexpensive release of intellectual property rights (IPRs); establish formal coordination/integration mechanisms between the responsible ministries

d. How is innovation policy coordinated and evaluated?

e. How is knowledge transfer supported?

f. How are industry/business-higher education/research institutes supported?

g. How accessible is research generated in higher education and Academy of Sciences to entrepreneurs and small and medium sized enterprises SMEs?

h. What are procedures for release of IPRs?

i. Is there innovation fund available also for researchers?

j. How available and developed is the entrepreneurship education in higher education? Does such education distinguish between different types of entrepreneurship and develop appropriate approaches for each?

k. Are there interdisciplinary undergraduate/graduate programmes which include business/entrepreneurship education? Could such be encouraged?

l. What is quality of local management schools? Do they deliver executive education, including affordable executive education for entrepreneurs and SMEs and for non-profit sector and governmental agencies?

M.6.3 Outreach activities

OBJECTIVES: to popularise (inform, explain and raise interest about) higher education and research among primary and secondary school pupils and general public

m. What outreach activities are organised by higher education institutions; for primary and secondary schools, and for general public?

n. How many "open to public" evens do higher education institutions hold?

o. What are other initiatives exist to popularize science?

Performance (functioning and utility) of the higher education system

The following is a list of preferred data for assessing higher education system performance. Not all data was available for this feasibility study and gaps in data are mentioned throughout the text so as to raise awareness for possible reforms in data collection. This list is the ideal list of data available, which should be considered in the preparation of the Higher Education Strategy for background analyses.

P.1 Governance

- Data/indicators collected at system-level: what data in which data warehouse/repository (any duplication?)

P.2 Higher education system – institutions and study programmes

- Number of accredited higher education institutions per type, ownership (public/private); geographical distribution (Yerevan *marz*/other *marzes*), geographical distribution of research-intensive higher education institutions (universities); per discipline/field/study programmes
- Higher education institutions per specific institutional profiles
- Licensing and accreditation status per higher education institutions
- Number of mergers or other forms of formal (institutionalised cooperation) among higher education institutions or higher education institutions and research institutes
- Number of research institutes , per disciplines/fields
- Number and types of accredited study programmes; distribution of study programmes per institutions; enrolments per study programmes; public funding per study programmes; broad-based or interdisciplinary study programmes; joint or double study programmes

P.3 Students – system level

- Tertiary education enrolment; as share of age cohort
- Higher education attainment 25-64; 30-34 age cohort (trends)
- Tertiary graduates per field of study; gender, origin (domestic vs international)
- Employment/unemployment rates of tertiary degree holders; per gender; per field; per location

P.4 Students - institutional level

- Number of students enrolled; of first-year students; of graduates: per study field (ISCED categories), per degree cycle; per gender; per mode of study; per type of higher education institution; per funding (stat places vs self-funded); per permanent (parents') residency (marz)
- Number of foreign students, origin, per type of study, per study programme/institution
- Outgoing and incoming short-term student mobility; destinations-origin, per study programmes; per higher education institutions
- Ratio of undergraduates to graduate students per institutions
- Average time to graduation
- Completion rate/drop-outs
- Employability rate
- Alumni satisfaction
- Employers satisfaction

P.5 Academic staff

- Number of academic staff/researchers: per gender, age, academic degree, academic status; per type of employment (in FTE, in person count); % of senior academic staff; % of full-time staff; % of academic staff with third-cycle degrees
- Salary ranges for academic staff
- Workload for academic staff
- Student-teacher ratio per institution
- Outgoing and incoming academic staff short-term mobility: destinations/origins

P.6 Funding

- Annual public expenditure on higher education institutions per student: system-wide, per higher education institution, per degree programme
- Relative proportions of private and public expenditure on higher education per institution/study programme
- Cost in tuition fees
- Cost of student maintenance (and other non-tuition costs)
- Number of state funded spaces per study programme/per institution

- Number of students receiving scholarships per higher education institution/study programme
- Number of students with disabilities
- Number of students with children
- Migrant students (1st generation migrant students)
- Students per secondary-level qualifications
- Time delay between leaving secondary school and enrolling in higher education
- Number of students working while studying

P.7 Research

- Research output/performance: grants, citations, patents: system-wide; university sector compared to other research sector; per higher education institutions
- Public expenditure for higher education, R&D as % of GDP by source of funding (trends)
- Public research funding per higher education institutions/subunits/departments and compared to research institutes
- Direct funding of research from private entities per institution
- International research collaboration: grants and project participation: system-wide; university sector compared to other research sector; per higher education institutions

P.8 Third mission

- Number of patents, licences per higher education institutions
- Number of spin-off companies per higher education institutions
- Revenue for knowledge transfer, services or use of facilities per higher education institutions
- Number of continuing education programmes per institution

Data sources

Data for this study has been obtained through desk research of extant secondary data (policy studies and reports and web sources); review of primary legal texts, statistical data and interviews (for full list see Appendix – data sources).

D.1 Secondary data sources

Desk research included surveying the policy reports available from various international organisations, project reports, and local consultancies (such as EV Consulting). The complete list of secondary data sources can be found in the Appendix.

D.2 Policy documents

Armenia Development Strategy for 2014-2025, RA Government Decree, 27 March 2014

Programme on subsequent integration of the Higher education system of Armenia into the European Higher Education Area, RA Ministry, 2012

Strategy on Development of Science for 2011-2020, May, 2010

Education Development 2016-2025 State Programme

D.3 Legal texts

Basic legal texts were consulted, in particular:

Government of the Republic of Armenia (1999) The Law on Education

Government of the Republic of Armenia (2004) The Law on Higher and Postgraduate Professional Education

Government of the Republic of Armenia (2001) The Law on State Non-Profit Entities

Government of the Republic of Armenia (2000) Law on scientific and technological activity

Government of the Republic of Armenia (2006) Law on the State Support to Innovation Activity

Government of the Republic of Armenia (2011) Decision 332-N on Approval of National Qualifications Framework of the Republic of Armenia

D.4 Statistical data

Eurostat (2015) East – Eastern Partnership, 2015

Statistical Yearbooks, National Statistical Service of the Republic of Armenia

World Economic Forum (2015) The Global Competitiveness Index 2015-2016: Armenia, World Economic Forum, 2015

World Economic Forum and Mercer (2015) The Global Human Capital Report 2015, World Economic Forum and Mercer, 2015

UNESCO (2015) Science Report: Armenia, UNESCO Publishing, 2015

UNESCO (2015) Education for all report: Armenia, UNESCO Publishing, 2015

D.5 Interviews

Evidence was obtained through semi-structured interviews/meetings with individuals and groups which included a broad range of relevant higher education stakeholders:

- Ministry officials from the Department of Higher and Post Graduate Professional Education, and from the State Committee on Science
- Representatives from the Parliamentary Committee responsible for higher education within the National Assembly
- ANQA representatives
- Representatives from rectors' council and the National Academy of Sciences
- ANSA (student association) representatives
- Representatives from the industry, and university-industry cooperation bodies
- Higher Education Reform Experts (HEREs) and Erasmus+ National Coordinator/Office
- Council of Europe (responsible for project on strengthening academic integrity in higher education)
- National Information Centre For Academic Recognition and Mobility (ENIC-NARIC)

In total, 11 interviews lasting 14 hours and including 42 individuals in total (for full list see Appendix).

3. Capabilities and performance of the Armenian higher education system

A. Governance and policy making

3.A.1 The legal and political contexts of higher education steering: laws, strategies and higher education governance

Higher education steering is defined as use of various mechanisms to move the higher education sector and its constituent parts in the direction of particular higher education objectives. **Typical steering mechanisms** include funding allocations (in the case of public institutions); regulation (institutional and programme accreditation); quality assurance requirements (units within institutions and institutional/quality audits); institutional strategic planning; and financial and performance reporting requirements (Baley, 2014).[15]

A precondition for government steering is development of a vision for higher education, its role and function, and such vision has to be developed jointly – in agreement – with key higher education stakeholders. From the vision, a national policy (a plan and strategy) is developed – aligned with the existing legal and regulatory frameworks. National policy has to be embedded within a broader framework of national knowledge policies, with convergence or even integration of objectives set by the science and innovation systems and overarching policies on socio-economic development. National strategy sets targets for various aspects of the sector, concrete measures to be undertaken and instruments to be developed and identifies those responsible for implementation of projected activities.

In the case of Armenia, higher education legislation has a strong steering impact on the structure of the higher education system as well as the provision of education in each institution. The national development programmes/strategies for education and research are adopted for five or ten years and usually supplemented with specific shorter-term action plans. Several separate policy documents influence higher education sector: general development strategies, science development programmes and education development programmes. The cross-references between these strategy documents are sparse and more policy coordination and policy integration would be advisable.

The existing input-based funding formula does not lend itself as a particularly effective steering tool towards improved performance, institutional and programmatic differentiation and addressing regional needs. Reform of the

[15] Baley, T. (2014) The role and functions of higher education councils and commissions in Africa. A case study of the Kenya Commission for Higher Education. Wymberg, South Africa: The Centre for Higher Education Transformation (CHET). http://chet.org.za/files/Kenya%20ROLE%20AND%20FUNCTIONS%20OF%20HE%20COMMISSIONS%20AND%20COUNCILS.pdf

funding mechanisms towards more performance-based measures could importantly contribute to such goal. Specific performance agreements developed between the Ministry and each (public) institution could set operational and qualitative goals for the institution and determine the resources required to reach these targets.

Licensing, accreditation and quality assurance evaluations are also important steering mechanism. Quality assurance evaluations need to be formative (developmental) in nature to fulfil their role to help institutions improve their operations. Institutions should be required to perform external evaluations of their operations and quality systems on a regular basis and publish the results.

While quality assurance is a fundamental aspect of accreditation, there seems to be a growing realisation that a distinction should be drawn between accreditation and quality assurance. In a number of countries the two processes are now being separated, with quality assurance agencies focusing more on support and help for institutions in their internal development of quality enhancement processes. ANQA should be helping institutions also in improving their internal quality assurance procedures. **Basic data collection on university operation** will hopefully be streamlined also on institutional level with the implementation of the national integrated system of data collection. Part of setting up the national systems should be providing data collection software to higher education institutions and training institutional researches in using it for the purposes of mandatory reporting and data analyses for institutional analyses and strategic planning. Internal quality assurance body or individuals (i.e. institutional researchers) need also to develop institutional analyses for strategic management purposes. One tool that stands out in internal QA operations is collection of **student feedback on satisfaction with/experience of individual courses and lecturers as well as overall satisfaction with the education provision** at the respective higher education institution and/or engagement in educational processes. Developing student questionnaires and methods of data collection is a challenging and highly relevant task (in some countries, the government or institutions have outsourced student surveys to private providers, such as Student Barometer by iGraduate[16] or SERU-Student Experience in Research Universities;[17] see Klemenčič and Chirikov 2015 for examples).[18]

[16] http://www.i-graduate.org/services/student-barometer/

[17] http://www.cshe.berkeley.edu/SERU

[18] KLEMENČIČ, M., CHIRIKOV, I. (2015). On the use of student surveys. In Remus Pricopie, Peter Scott, Jamil Salmi and Adrian Curaj (eds.) Future of Higher Education in Europe. Volume I and Volume II. Dordrecht: Springer. http://scholar.harvard.edu/manja_klemencic/ns

3.A.2 Higher education reforms: laws and strategies

Since the independence in 1991, Armenia has undergone significant reforms of its social and economic systems, of which higher education is one part. The initial reforms were concerned with consolidating the statehood. This is how Law on Education (1999) and Law on Scientific and Technological Activity (2000) came to existence.

The more wide-ranging legal and structural reforms of the higher education systems commenced in 2004 with the Law on Higher and Postgraduate Professional Education. In 2005, Armenia formally joined the Bologna process and began initially with introduction of two-cycle structure (undergraduate-graduate) and introduced the credit system (ECTS). In 2006, it formed the National Information Centre for Academic Recognition and Mobility (ENIC) (ArmENIC; http://www.armenic.am/and), and in 2007 introduced the Diploma Supplement. In 2008, the National Center for Professional Education Quality Assurance (ANQA; http://www.anqa.am/en/) was founded. The third cycle of higher education structure was confirmed in 2006 in the program on "The implementation of a three-level degree system of higher education in RA" and in 2010, the three-cycle higher education structure (Bachelor – Master's – Researcher) was introduced. Following the Bologna recommendations, in 2011, the National Qualifications Framework was adopted. In the same year new accreditation criteria were adopted. The year 2016 will be marked by two overlapping and mutually reinforcing processes: the preparation of the new Higher Education Law and the new Higher Education Strategy 2016-2025.

Parallel to policy development in the area of higher education, there were reforms in other sectors with more or less influence on higher education sector. State Committee of Science (SCS) was established in 2007 as part of the Ministry of Education and Science (MES). The committee was given the responsibility to elaborate and implement scientific and technology policy and participate in the elaboration of innovation policy for which the Ministry of Economy hold responsibility. One of the key policy documents prepared has been the Strategy on Development of Science 2011-2020 approved by the Government in 2010.

Table 1 Timeline of higher education reforms

Timeline of reforms:	*Policy making*
1999: The Law on Education	Ministry of Education & Science (MES)
2000: Law on Scientific and Technological Activity	MES
2004: Law on Higher and Postgraduate Professional Education	MES

2004: RA National Assembly ratified Lisbon Convention on Mutual Recognition of Qualifications	MES
2005: Armenia joins the Bologna Process at the Bergen Ministerial Summit	MES
2005: Two-cycle structure (undergraduate-graduate) is implemented	MES
2005: The Credit System/ECTS/ was introduced	MES
2006: National Information Centre for Academic Recognition and Mobility (ArmENIC; http://www.armenic.am/) was founded	MES
2006: The program on "The implementation of a three-level degree system of higher education in RA" was confirmed	MES
2006: Law on states support to innovation activities	Ministry of Economy (MOE)
2007: Diploma Supplement is introduced	MES
2007: Government resolution on State Committee of Science (SCS)	MES
2008: IT Sector Development Strategy	MOE
2008: Government resolution on State Program of Education Development for 2008-2015	MES
2008: National Center for Professional Education Quality Assurance (ANQA; http://www.anqa.am/en/) was founded	MES
2008-2009: Creation of an independent scientific expertise system	MES/SCS (State Committee on Science)
2010: Three-cycle structure (Bachelor-Master's-Researcher) is implemented	MES
2010: Strategy on the development of science for 2011-2020	MES/SCS
2011: National Framework of Education Qualifications is prepared consisting of 8 levels	MES
2011: Government confirmed higher education financing strategy	MES
2011: Resolution on Accreditation Criteria for RA Professional Education was adopted	MES
2011: Order Issued on Accreditation of RA Professional Education Institutions and their specializations was adopted	MES
2011: Law on National Academy of Sciences adopted	MES/SCS
2011: Program to promote the development of social sciences	MES/SCS
2011: Program on unifying Armenian scientists worldwide	MES/SCS

2012: Strategy on development of Armenology for 2012-2025	MES/SCS
2012-2015: Armenia hosts the Bologna Secretariat	MES
2014: Armenia Development Strategy for 2014-2025	MOE
2015: Armenia hosts the Yerevan Ministerial Summit	MES
2015-2016: Preparation of new Education Strategy 2016-2025	MES
2015-2016: Preparation of new Higher Education Law	MES
2015-2016: Preparation of new Higher Education Strategy for Republic of Armenia 2016-2025 prepared	MES

There are three policy-documents which are interrelated with the forthcoming Higher Education Strategy and need to be considered: Armenia Development Strategy for 2014-2025, and the draft of the Education Development 2016-2025 State Programme.

3.A.2.1 Armenian Development Strategy 2015-2025

A. Education - higher education priorities in the ADS

In the Armenia Development Strategy (ADS), creation of quality and high productivity jobs is stated as the main objective, and development of human capital is expressed as one of the key priorities. The strategy also highlights the objective to support activities aiming at citizens' personal development, professional growth, civic education and enhanced cultural level; all of which are directly related to education, including higher education.

The following section lists the key priorities and actions stated in the ADS, which are specifically relevant for the Higher Education Strategy.

Priority 1: Human capital development and increase of competitiveness

The objective for capacity building and increase of competitiveness (p. 45) through:

1) "co-funding of human resources training programs" [such training programmes could be conducted by or in cooperation with universities];

2) "promoting research studies and developments" [again, these should be conducted at higher education institutions or in cooperation with universities];

3) "foundation of technoparks and industrial parks" [as it is practice elsewhere, such parks could/should be founded in cooperation with universities];

4) "provision of grants for joint researches and developments by companies and higher educational institutions" [this objective explicitly mentions cooperation with higher education institutions]

Priority 2: IT sector development

The IT Sector Development Strategy from 2008 explicitly mentioned as an objective increase in the quality of IT sector graduates, which resulted in a number of initiatives, such as Microsoft Innovations Center at National Polytechnic University, which has contributed to students' development of professional skills and capacity building through application of Microsoft tools and programs. In the IT sector, ADS plans continued support to "universities in implementation of modern curricula and acquisition of necessary laboratories, through promotion of their cooperation with private sector" (p.48). Similar initiatives are mentioned, although less explicitly, also in relation to development of other sectors, such as agriculture and tourism.

Priority 3: Entrepreneurship education

The policies related to small and medium size enterprises include, for example, entrepreneurship education: "Support to development of beginner businesses including measures directed at capacity building and skills development, business planning, and ensuring access to finance for beginners. Particular programs will be targeted at promoting business among women and young people [**entrepreneurship education**]." (p. 56). Again, in this area, higher education institutions could/should play an important role.

Priority 4: Regional development

Armenia also faces uneven regional development whereby the vast majority of economic development is focused in Yerevan and neighbouring regions. Accordingly, unemployment and poverty levels tend to be higher in more peripheral regions. Ensuring even regional development is high priority for Armenian Development Strategy. The role of higher education and science is not specifically mentioned in terms of reaching this objective, but both clearly can play an important role. There is ample research showing the benefits of universities for regional growth (Capello et al.),[19] as well as practical guides on, for example, Connecting Universities to Regional Growth: A Practical Guide (European Union – Regional Policy, 2011).[20] What these studies show that universities perform multifaceted functions in the regions, not just developing human capital and knowledge, but acting as educational and cultural network institutions, which bring together and connect various

[19] Capello, R., A. Olechnicka and G. Gorzelak (2012) Universities, Cities and Regions Loci for Knowledge and Innovation Creation. Routledge.

[20] European Union – Regional Policy (2011) Connecting Universities to Regional Growth, A Practical Guide. http://ec.europa.eu/regional_policy/sources/docgener/presenta/universities2011/universities2011_en.pdf

communities of practice and can influence innovation processes not only in economy but also social innovation. They can retain and attract talent. They can cater for enterprise and business development. They enhance social equity.

Priority 5: Quality of education as precondition for human capital development

The Armenia Development Strategy explicitly recognises the education sectors to be one of the important preconditions for human capital development: "Thus, developments in this sector are one of the development priorities of the country. Increasing the quality and effectiveness of education at all levels of the educational system, increasing the relevance of different levels to international standards and ensuring affordable/accessible education for all groups of the population are priorities for the development of the sector." (ADS, 2014, page 104).

The following table summarizes the concrete recommendations on higher education in the ADS (in the section Education (ADS 2015, p. 115-116).

Table 2 Armenia Development Strategy 2015-2025: key recommendations on higher education (ADS 2015, p. 115-116) (emphasis added)

460. Given the extreme importance of human resources for the country's long-term socioeconomic development, professional education should be the next priority during the program implementation.
In terms of professional education the program envisages to:
1) **Improve access** to secondary and higher professional education for all population groups.
2) **Improve the quality of professional education** and bring it in line with demands of the labour market, promote employment of graduates.
3) **Improve effectiveness of higher educational system**, including structural changes, network review and improvement of the management system.
4) Balance public regulation and financing systems of higher educational establishments, **expand autonomy and academic freedom** of higher educational establishments, expand state higher educational establishments' **organizational and legal status** and ensure **diversity**.
5) **Academic development** of higher educational establishments, **strengthening the research component in higher educational establishments**, implementation of modern academic **financing methods** of higher educational establishments.
6) Continue reforms aimed at streamlining professional education in line with the **country's strategic educational and scientific development goals**, provisions of Bologna and Turin Agreements. Particularly:
a) promotion of mutual recognition and mobility,

b) improvement of the system of accumulation and transfer of academic credits,

c) integration of higher education and research activities,

d) implementation of internal systems to improve the quality of professional education and institutional and program accreditation of public and non-public higher educational establishments,

e) development of vocational and continuing educational systems.

At the same time, improvement of the **quality of higher education** dwells on the following priorities:

a) strengthening conditions for licensing of higher educational establishments in accordance with European standards and procedures,

b) strengthening of the list of professions and granted qualifications and their harmonization with UNESCO and Eurostat classification,

c) continuing internationalization of the higher education system through promotion of joint educational programs with European universities and joint granting of qualifications, which will definitely result in greater mobility of students and the faculty.

7) **Higher education financing reform**, including diversification of financing sources and mechanisms for higher educational establishments, improvement of targeting and effectiveness of state programs on student support, **expansion of the volumes and forms of financial support of students**, increase of state funding of higher education, promotion of higher education and business community cooperation, promotion of private investments, financing of innovative programs aimed at development of higher educational establishments and modernization of higher education.

B. Science – research priorities – as related to the higher education sector - in the ADS

In the Armenia Development Strategy science is recognised as crucial for development of economic competitiveness. The development vision for science "implies developing Republic of Armenia into a knowledge-based economy, which is competitive in the European scientific and technical community in terms of its fundamental and applied scientific research and development". In this area, the Strategy follows closely the provisions made in the Strategy on Development of Science for 2011-2020, which formulated the following targets:

1) Creation of a system capable of sustaining the development of science and technology;
2) Development of scientific potential, modernization of scientific infrastructure;
3) Promotion of basic and applied research;
4) Creation of a synergistic system of education, science and innovation; and

5) Becoming a prime location for scientific specialization in the European Research Area.

The following section lists the key priorities and actions stated in the ADS, which are specifically relevant for the scientific activity – research at higher education institutions.

Priority 1: Optimisation and structural reforms of research sector

The structural and territorial objectives refer explicitly to the need for optimisation and structural reforms of scientific and technological activities "by uniting state organisations of similar scientific direction" which work under various ministries. The concrete suggestion is made from about 35 scientific research institutes which function within the structure of various ministries "at least some of them can be moved under the Armenian Universities or relevant scientific organizations" to improve their performance effectiveness. There is no specific mentioning of possible restructuring of institutes under the National Academy of Sciences, apart from the indirect mentioning that the number of scientific institutes has been decreasing dictated by optimisations of the scientific organisations and financial allocation to these establishments. The Strategy calls also for **improved evaluation tools of scientific organisations'** activities and introduction of **performance-based incentives** for research excellence (at institution's level), which could be coupled by the existing program by SCS for individual scientists. Furthermore, the Strategy point to **uneven territorial distribution** of scientific activity, concentrated in only few *marzes* and completely absent in the rest.

Priority 2: Improved salaries, clear career paths for researchers and doctoral education

Among resources and infrastructure, the Strategy specifically mentions the need for improved scientists' wages (to the level of average salary in the economy) and programs for attracting young researchers, including annual grant programs supporting research activities by PhD students and young academic workers. Development of a clear scientist professional career path is also highlighted as well as reforms of doctoral education **to streamline the content of PhD training and quality** of these. Specifically, the Strategy mentions that "Creation of **research universities** in Armenia should be the first step towards implementation of modern methods of education of science and educational personnel. International experience suggests that research universities enable much more effective combination of educational and scientific components…It is more appropriate for our research universities to implement post-graduate /post-diploma/ higher education based on Master's degree and Bachelor-based (first degree) post-graduate, researcher programs." Two further concrete propositions are given: 1) possibility for opening of

technological research university on the basis of natural sciences; and 2) a need of developing mechanisms for organization of **targeted post-graduate education and post-doctoral courses at international lead scientific and educational centres**. The latter could be understood as proposing that the research institutes within the National Academy of Sciences also add an education dimension to their activities, i.e. degree granting post-graduate programmes, which indeed is something that already takes place albeit on small scale.

Priority 3: Strengthening science-economy relations [higher education-science-economy relations]

Science-economy relationship is also highlighted in the Strategy, both in the sense of improved collaboration between both sectors as well as commercialisation of science. The strategy is clear that development of an effective innovation system requires "involvement of venture capital, creation of scientific and industrial centres, as well as establishment of business incubators and techno parks at universities". Tax incentives are specifically mentioned as one of the tools for preserving the country's intellectual and educational potential."

The following table summarizes the key points on implementation of the ADS related to research aspect in higher education sector.

Table 3 Key points on implementation of ADS (2015-2025)

Implementation of this vision requires:
1) Development of a system for sustainable development of science and advanced technologies,
2) Upgrading material and infrastructure base of scientific activities,
3) Ensure stable growth of highly qualified workforce in scientific and technical fields,
4) Attract young specialists to science and implement manageable and smooth change of academic generation,
5) Ensure effective state sponsorship of fundamental academic studies and advanced development,
6) Promote implementation of researches providing know-how applied in economy, as well as increase of the number of innovations and patents in scientific organizations,
7) Develop harmonious system for development of science, technologies and innovation-based knowledge, promoting participation of private business in scientific events, ensure targeted application of gained knowledge in education and different spheres of economy, and
8) Considerably expand international cooperation in the field of science and technologies.

3.A.2.2 The draft Education Development 2016-2025 State Programme of the Republic of Armenia

Table 4 Strategies to be applied at all education levels stated in the draft Education Development 2016-2025 State Programme of the Republic of Armenia

1) **Need-oriented planning**, which implies diversified and flexible curricula, forma and methods of organising education processes, including
distance learning opportunities; inclusion of extracurricular institutions in education processes (e.g. cultural centres); diversification of educational systems through appropriate legal forms (i.e. foundations); joint establishments of educational institutions, and participation of social partners in management.
2) **Social dialogue**, which implies improved participatory decision-making and social dialogue mechanisms.
3) **Collaboration with partners** from the private sector and civil society shall be strengthened; also mentioning possibilities for outsourcing certain functions and supplemental services to private providers.
4) **Transparency and accountability**, which implies strengthening monitoring and supervision mechanisms to ensure quality assurance and accountability.

Table 5 The key principles of state policy of education development in the draft Education Development 2016-2025 State Programme of the Republic of Armenia

1) **Inclusiveness** - Development and implementation of state educational policy shall involve all the groups of the society including vulnerable groups. Every citizen and interested non-governmental organization shall have an opportunity to make their contribution in the processes of decision-making, service provision and result evaluation. Such an opportunity shall also be given to our Diasporan compatriots.

2) **Balanced territorial development** - Balanced territorial development is the essential prerequisite of sustainable development. Ensuring equality in the educational system and mitigation of unequal territorial development through education shall be the pivotal principles of the implemented policy.

3) **Combination of national and universal values** - The educational system of Armenia has adopted the policy of international integration, which implies alignment of the educational system with international standards and values. The process shall be anchored on national including Christian value system.

4) **Transparency and accountability** - Effective collaboration between all stakeholders is an important precondition for progress which can only be ensured in a more transparent environment and in case of open accountability.

Table 6 The goals concerning higher education in the draft Education Development 2016-2025 State Programme of the Republic of Armenia

1) Goal 3. Ensure affordable and equal opportunities for all to obtain professional education by 2025.
2) Goal 4. Increase the number of young people and adults with professional skills by 50 per cent by 2025 with the purpose of finding decent jobs for them, decreasing unemployment and boosting businesses.
3) Goal 5. Ensure equal participation opportunity of all vulnerable groups, including persons with special educational needs, in all the levels of education by 2025.
4) Goal 6. Equip all students with knowledge and capabilities contributing to sustainable development of the society via civil, democracy and human rights and ecological education.

3.A.2.3 Summary

Considering both policy documents several principles and strategic priorities emerge which need to be considered in preparation of the Higher Education Strategy to ensure consistency and complementarity.

Table 7 Key principles emerging from the ADS and the draft Education Development 2016-2025 State Programme

Principles emerging from the Armenia Development Strategy and the draft Education Development State Programme
Inclusive and transparent policy making processes; social dialogue on higher education and research
Better policy integration between higher education, science and innovation; creation of a synergistic system of education, science and innovation; strengthening collaboration between higher education sector, science sector and industry, business and civil society
Higher education and research play key role in regional development
Strengthen monitoring and supervision mechanisms to improve transparency and accountability; improving performance measurement
Strengthen internationalisation and international cooperation in higher education and research; aligning education and science systems with international standards and values, while respecting local needs and values.

Table 8 Strategic objectives emerging from the Armenia Development Strategy and the draft Education Development State Programme

Strategic objectives emerging from the Armenia Development Strategy and the draft Education Development State Programme		
	The draft Education Development 2016-2025 State Programme of the Republic of Armenia	Armenia Development Strategy 2015-2025
Governance and policy making	Development and implementation of a mechanism for transparency and accountability, including public accountability of higher educational establishments. Targeted involvement of beneficiaries in the educational, management and research processes of higher educational establishments and expansion of collaboration. Software expansion and improvement of management information systems of professional education. Expansion of organizational, financial, staffing autonomy and academic freedoms of higher educational establishments. Establishment of decent behaviour principles and ethics, their application, development and implementation of a mechanism for supervision and prevention of corruption risks. Implementation of introduction of RA national qualification framework (NQF) in-line with the qualifications of the European education area Introduction of a system of assessment and recognition of learning outcomes of non-formal and informal education.	
Licensing, accreditation and QA	Contribution to the RA National Center for Professional Education Quality Assurance Foundation's full-fledged membership in the European Association for Quality Assurance in Higher Education (ENQA) and registration in the European Quality Assurance Register for Higher Education (EQAR). Comprehensive development and implementation of the processes of external evaluation of the quality of higher educational establishments and intercollegiate quality assurance. Improvement of the licensing process of higher educational establishments by making licensing terms and requirements stricter. Specification of the RA national framework of	

	qualifications and development of its introduction strategy, implementation of self-accreditation. Development of higher education programmes with outcomes based on the RA national framework of qualifications, increase of employability of graduates and alignment of professional knowledge, capabilities and skills with current requirements of the labour market.	
Structure of higher education and research systems	Restructuring of institutions with fewer students and repeating professions. Promotion and expansion of competitive innovative programmes.	Organisation of technological research university. Uniting state organisations of similar scientific direction "which work under various ministries; at least some of them can be moved under the Armenian Universities or relevant scientific organizations." Decrease number of scientific institutes.
Funding and access	Development of a new mechanism of funding higher educational establishments based on the performance of the higher educational establishment, programme and non-programme funding principles and diversification of funding sources. Development and introduction of new mechanisms of remuneration of professors and production masters. Development of new mechanisms for financial support (benefits, scholarships) to students. Ensuring affordability and accessibility of higher education for various social groups and persons with special educational needs.	Improved wages of scientists. Funding programmes for young scientists. Performance-based funding for scientific establishments. Programs for funding institutional research excellence along with individual scientists' research excellence.
Education	Modernization of specialties and qualifications and attunement with the demand of the labour market and qualification descriptors of professional areas. Introduction of new contemporary professions with the purpose of imparting narrow specialization to the educational establishments. Development and review of educational programmes based on learning outcomes. Encouraging access of specialists working in productions to educational institutions and organization of professional training for all lecturers in corresponding enterprises. Identification of on-the-job learning	Organization of targeted post-graduate education and post-doctoral courses at international lead scientific and educational centres. Improve the quality of professional education and bring it in line with demands of the labour market, promote employment of graduates. Entrepreneurship education.

	opportunities and introduction and application of up-to-date approaches. Implementation of entrepreneurial education in short-cycle and vocational schools.	
Research		Development of a system for sustainable development of science and advanced technologies. Upgrading material and infrastructure base of scientific activities. Ensure stable growth of highly qualified workforce in scientific and technical fields. Clear career paths for scientists.
Third mission	Expansion of opportunities and forms of entrepreneurial activity of short-cycle and vocational schools by creating relevant mechanisms and fundamental and favourable preconditions.	Promote implementation of researches providing know-how applied in economy, as well as increase of the number of innovations and patents in scientific organizations. Develop harmonious system for development of science, technologies and innovation-based knowledge, promoting participation of private business in scientific events, ensure targeted application of gained knowledge in education and different spheres of economy.
Internation alisation	Expansion of the mobility of students and professors and internationalization of higher educational establishments. Creation of dormitory complexes and promotion of teaching in a foreign language which will result in the increase of the number of foreign students in Armenia.	Considerably expand international cooperation in the field of science and technologies.

Recommendations

R.1.1 Principles and strategic objectives

- R.1.1.1 Ensuring that *the principles* stated in the draft Education Development 2016-2025 State Programme of the Republic of Armenia and Armenia Development Strategy 2015-2025 are duly considered in the new Higher Education Strategy, in particular:
    - Inclusive and transparent policy making processes; social dialogue on higher education and research
    - Better policy integration between higher education, science and innovation; creation of a synergistic system of education, science and innovation; strengthening collaboration between higher education sector, science sector and industry, business and civil society
    - Higher education and research contributing to regional development
    - Strengthen monitoring and supervision mechanisms to improve transparency and accountability (education data management); introduce performance measurement
    - Strengthen internationalisation and international cooperation in higher education and research; aligning education and science systems with international standards and values, while respecting local needs and values.
- R.1.1.2 Further developing *the strategic objectives concerning higher education* stated in the draft Education Development 2016-2025 State Programme of the Republic of Armenia and Armenia Development Strategy 2015-2025 (see details above).

3.A.3 Higher education governance

Higher education governance at the system level refers to the structures, processes and activities as well as legal and policy frameworks, which are involved in planning, managing and coordinating the higher education sector and its constituent parts. System governance takes place in a particular form of state-higher education institution relationships, which are constituted around the norms of academic freedom, institutional autonomy and accountability (Bailer, 2014) whereby the state has traded the direct control and micromanaging the institutions for supervisions ("the evaluative state") (Neave, 1998).[21] The supervisory model implies "multi-level multi-actor" governance which implies redistribution of policy-making powers,

[21] Neave, G. (1998) The Evaluative State Reconsidered. European Journal of Education, Vol. 33, No. 3.

responsibilities and accountability among internal (i.e. the parent ministry and its relevant departments or units) and external (i.e. representatives of higher education institutions, students representative associations, industry, etc.) stakeholders. In system-level governance typical bodies include (Eurydice, 2008):[22]

- A parent ministry (and its relevant department or unit) with overall responsibility for policy-making, strategic planning and ensuring compliance;
- Semi-autonomous agencies responsible for distributing and monitoring public funds, external quality assurance and regulation (including setting norms and standards), and/or giving expert advice and monitoring/analysing trends to inform advice; and
- Informal national-level forums comprising of rectors of higher education institutions and often also student representatives (from national student associations) that can make proposals to the parent ministry regarding the development of the sector. These intermediary or buffer bodies play advisory function and connect the national with institutional governance.

In some countries a special national body – a council or commission - has been established by government decree which provides a formal space for policy dialogue between government officials and representatives from the institutions and students (and possibly also industry through chamber of commerce and university teachers trade unions if such exist). Such body plays different role in different systems, but its generic role is to provide space for structured dialogue between higher education stakeholders and inform policy.

In Armenia, the Ministry of Education and Science is the overarching regulatory body responsible for education and science. The Higher and Postgraduate Professional Education Department of the Ministry supervises public higher education institutions except several specialized institutions under the jurisdiction of different ministries (the Ministry of Defense, the Police, the Ministry of Emergency Situations, and Mother See of Holy Etchmiadzin) and all private higher education institutions. The Ministry grants funding and exercises oversight and auditing.

[22] Eurydice (2008) Higher Education Governance in Europe: Policies, structures, funding and academic staff. Brussels: Eurydice.

Several special bodies have been established within the Ministry to help develop government policy and oversee its implementation:

1) The State Committee of Science is part of the Ministry of Education and Science and is the leading public agency for the governance of science. It has two main responsibilities: (1) to prepare legislation, policies, rules and regulations on the organisation and funding of science, (2) distribute competitive research funding to complement basic funding of public R&D institutions; this funding has dropped over the years in relative terms. SCS is also the lead agency for the development and implementation of research programmes in Armenia.
2) The Higher Certification Commission acts as an accreditation and certification body. The Commission also delivers doctoral degrees and it is in charge of organising the thesis defence.
3) The State Licensing and Accreditation Service, which was set up by the Ministry of Education, grants licences to higher education institutions and has also accreditation competence.

There are a number of national "councils" set up by the government (often by a decree) to fulfil a specific purpose.[23] Several Councils directly or indirectly cover the field of higher education and research:

1) The National Centre for Professional Education Quality Assurance Foundation (ANQA) was established in 2008 as an independent foundation for promoting quality education at tertiary level. ANQA is currently funded and subsidised by the Armenian government and it is projected to be financed through entrepreneurial initiatives.
2) Noravank Scientific-Educational Foundation was established to mobilize scientific thought in Armenia and the Diaspora, implementation of research and engineering, training and retraining activities, development and implementation of new teaching and learning mechanisms, creation of an information network, publishing work, holding of scientific seminars, conferences, forums and other lawful activities.
3) Council on Armenian Studies to coordinate work on Armenian studies and record new developments.
4) Youth Fund of Armenia (AYF) has primary objectives to assist in democratic processes taking place in Armenia, development of a legal state and civil society, to take part in collecting, coordinating and

[23] http://www.gov.am/en/councils/

organizing for publication information on issues in the youth sector in Armenia, as well as abroad, to organize the dissemination and presentation of cultural, educational and historical heritage of Armenia, support talented young people, strengthen Armenia-Artsakh-Diaspora ties, develop and implement joint projects, take part in the implementation of projects aimed at solving problems in environmental protection, health care, media and publishing activities, youth welfare, sports, youth employment, vocational guidance, training and retraining, as well as other related fields.

5) National Youth Policy Council was established in 2009 in an effort to enhance efficiency of youth policy in the Republic of Armenia and encourage participation in decision-making processes. The Council has the goal of contributing to the design and implementation of national youth policy, encouraging youth involvement in different spheres of public life and assisting youth organizations with their activities. The Council incorporates representatives of both public stakeholders and civil society on the basis of parity.

6) Scientific-Technical Council promotes innovative approaches in the economy, as well as to enhance efficiency of legal acts applicable in this field, develop fundamental criteria for programs implemented in the industry sectors (including the military-industrial complex), and agricultural development programs. (Ministry's State Committee on Science is represented on the Council.)

7) Armenia's Social Investment Fund to improve living standards, rehabilitate social and economic infrastructure in communities, support and build capacity within territorial management and local self-government authorities of the Republic of Armenia. (RA Minister of Education and Science is represented on the Council.)

Among the consultative bodies to the government, the most visible are:

- The Armenian National Academy of Sciences (NAS), which is a highest state scientific self-governing organization uniting NAS Members and scientific staff of affiliated scientific and research institutions. The Academy promotes and carries out fundamental and applied research in different scientific fields, as well as coordinates research carried out throughout Armenia. It is mainly funded from the state budget, however has an autonomous legal status.
- The Council of Rectors of the Armenian State Higher Education Institutions and the Council of Rectors of Private Higher Education Institutions, which are both non-governmental professional associations and advisory to the Ministry. They involve rectors of the

respective higher education institutions and work towards development of systematic approaches towards education policy, promotion of education and research activities. The Rector of Yerevan State University is also the chairperson of the Council of Rectors of State Higher Education Institutions.

- Armenian National Students' Association (ANSA) was created in 2003 and is umbrella association representing 90,000 students via 18 local unions at public and private universities. ANSA is full member of the European Students' Union.

In Armenia, there is no national council that would specifically focus on higher education. There are several national councils that touch on the issue of higher education policy and representatives from the Ministry for Education and Science are included in these councils, however, the issues covered by the councils are wide-ranging and can present various bits of higher education policy only in highly fragmented manner. In absence of a national council, the contacts between the ministry and various stakeholders are presumably informal by the way of meetings or special-purpose working groups. Informal contacts can work very effectively especially in small countries with tight social networks, but they do pose a threat of some stakeholders not being included in the key meetings and processes and thus not having influence on higher education policy making. For smaller system especially a high level of consensus building and cooperation between stakeholders in higher education system – including institutions, different departments within government, funding agencies and the private sector is essential. These cooperation mechanisms ought to be formalised and be transparent as to prevent corruption and nepotism.

For a successful completion of formation for the new Higher Education Law, and the new Higher Education Strategy 2016-2025 it is crucial that the preparation is conducted in open, transparent and inclusive process with full involvement of all relevant stakeholders. Since higher education is an issue that cuts through several governmental structures, full involvement of representatives also from other relevant Ministries (such as Ministry of Economy) is needed. The role, status and areas of activities of key stakeholder associations, such as the National Councils of Rectors and the National Students' Association, should be clearly marked in both processes and also formalised to establish corporatist relations between the state and the key representative associations.

Finally, constructing a national knowledge system to create synergies between higher education, research and innovation systems requires defining closer relationships between various governance structures (e.g. different departments within Ministries) and various actors coming from so-far separate sectors (government bodies, higher education institutions, research

institutes, industry and business). Stronger internal coordination between various parts of the ministry dealing with aspects of higher education is advisable. The poor linkages between education, science, research and development and industry have been exposed by number of analyses as one of the critical shortcomings in Armenia's knowledge systems (UNECE, 2014).[24] UNECE argues that the governance structure split between the State Committee of Science and the Ministry of Economy reinforces the disconnection between the two subsectors. Furthermore, the Armenian Development Strategy suggests that governance of science areas which is now divided between several ministries could be brought under one or fewer ministries.

Recommendations

R.1.2 Policy-making processes and relations to stakeholders

- R.1.2.1 Ensuring *open, transparent and inclusive policy-making processes* towards the new Higher Education Law, the new Higher Education Strategy 2016-2025 and beyond: the role, status and areas of activities of key stakeholder associations, such as the National Councils of Rectors and the National Students' Association, should be clearly marked in both processes; inclusion of all relevant ministries and governmental bodies should be ensured.
- R.1.2.2 Strengthening *coordination mechanisms of different aspects of higher education policy within the government*, i.e. between Ministry of Education and Science and its departments and the other relevant ministries, such as, for example, the Ministry of Economy, and their subunits.
- R.1.2.3 Formalising relations between the ministry and the key representative stakeholder associations (including national student association) to *establish corporatist relations between the state and the key representative associations*. This can be achieved by a way of regular formal meetings (minimal level of formalisation) or a national advisory body (such as, the National Youth Policy Council for youth policy), which would present the most institutionalised and formalised form of relations.

[24] UNECE - United Nations Economic Commission for Europe (2014) Innovation performance: Armenia

3.A.4 State-institutions relations: institutional autonomy and licensing, accreditation and quality assurance

Institutional autonomy, in all of its dimensions – organisational, financial, staffing and academic, has been linked to quality enhancement and institutional positioning in selected market niches, and to better financial sustainability through diversifying income streams. The recent study by the European University Association in the framework of the ATHENA Project (Athena Project, 2015)[25] places Armenia higher than other countries in the region concerning institutional autonomy (except on issues of academic autonomy), however, it also puts forward several challenges and recommendations for further reforms.

Major challenges that the project report identifies are: (1) complex and burdensome combination of legal statuses for public universities as well as (2) universities unable to create their own legal entities or undertake commercial activities without state approval; (3) excessive state representation on university governing and managements bodies and (4) legal requirements for government approval of new rector (Athena Project, 2015, 25; World Bank, 2013, 24 -26)[26].

The study recommends – and this author concurs – that a single legal status and legal code to govern higher education institutions is needed. Currently, higher education institutions are categorized into seven sub-groups by legal status: non-commercial state organisations, state foundation; inter-governmental higher education institutions of joint governance, inter-state foundations, for-profit private LLCs and cooperatives, not-for-profit private foundations, and branches of foreign universities (World Bank, 2013, 12). Further recommendation is to diminish the presence of government representation and formal influence in university governance and management.

Furthermore, according to the World Bank study (2013, 32), many state higher education institutions are severely constrained by the Law on State Non-Commercial Organizations (SNCOs) to be engaged in entrepreneurial activities, placing the power to the hand s of the founder – the state - to determine such activities and what happens with the profits.

The World Bank study (2013, 29-30) also suggests that the existing legislation neither allows nor motivates higher education institutions to be actively engaged in research and development: "The Law on SNCOs restricts HEIs' engagement in commercial activities that are allowed in their charters. This

[25] Athena Project (2015) The Athena Project on 'Fostering Sustainable and Autonomous Higher Education Systems in the Eastern Neighbouring Area', which involves Armenia, Moldova and the Ukraine, (A Tempus IV Project). http://www.athena-tempus.eu

[26] World Bank (2013) Addressing Governance at the Center of Higher Education Reforms in Armenia, World Bank, 2013.

means that if research is not included in the list of commercial activities in the charter of an HEI, that HEI may not be engaged in research, although it is stated in several legal acts that HEIs have to be engaged in research activities as one of their main tasks. Moreover, the Law on Scientific and Scientific-Technical Activities does not clearly define whose property the outcomes of scientific work would be, providing HEIs and researchers little incentive to invest in research even within the areas where they are allowed to conduct research."

Another challenge concerns academic autonomy of universities. The World Bank study identifies excessive government control over academic affairs, such as government-mandated study content, government control over student selection and selection exams, approval of study courses and strict regulations regarding the official language of instruction (Athena Project, 2015, 29; World Bank, 2013, 29).

Finally, Armenian higher education institutions are still perceived as not having fully developed strategic management capacities (La Manche, 2014)[27] and there is need to further strengthen formal mechanisms allowing for student participation in institutional governance and internal quality assurance procedures (World Bank, 2013; Smith and Hamilton, 2015).[28]

Recommendations

R.1.3 Governance and autonomy

- R.1.3.1 *Balance the presence and formal influence of government* in institutional government and management bodies with *targeted involvement of higher education beneficiaries (stakeholders)* in management of higher education institutions; *expansion of cooperation with external stakeholders/beneficiaries in educational and research processes*.
- R.1.3.2 Supporting development of *strategic management of higher education institutions* (possibly through external quality assurance and performance-based funding).
- R.1.3.3 Introducing and fully implementing and monitoring the application of legal provisions on *academic integrity and ethical behaviour* in all aspects of higher education and research.
- R.1.3.4 Ensuring the *independence of student associations* within higher education institutions and consolidating provisions which give students

[27] La MANCHE Project on 'Leading and Managing Change in Higher Education', which involves Armenia among other countries (http://www.lamanche-tempus.eu/); in particular the publication Changing Higher Education Institutions in Societies in Transition: In-depth Study Report (La Manche, 2014).

[28] Smith, I. and T. Hamilton (2015) Strengthening integrity and combating corruption in higher education in Armenia: Risk analysis of issues affecting the integrity of the Armenian higher education system, Council of Europe, 2015.

possibilities to participate in institutional governance and quality assurance structures and processes.

R.1.4 Licensing, accreditation and quality assurance

- R.1.4.1 Working towards ANQA's full membership in the European Association for Quality Assurance in Higher Education (ENQA) and registration in the European Quality Assurance Register for Higher Education (EQAR).
- R.1.4.2 Comprehensive development and implementation of the processes of *external evaluation* of the quality of higher educational institutions with *formative (developmental) purpose* and supporting internal systems of quality assurance at the higher education institutions.
- R.1.4.3 Introducing *a consolidated or a single legal status and legal code to govern higher education institutions*; also giving higher education institutions more freedom in terms of commercial operations.
- R.1.4.4 Specifying conditions for *university status and clarifying distinctions between different institutional types* (or streamlining institutional types into fewer clearly distinguishable categories); making *licencing terms and requirements stricter*.
- R.1.4.5 Full implementation of the *national framework of qualifications* and development along with definition of *study programmes based on learning outcomes* (tuning methodology), and reorganisation and revision of study programmes to better match the recognised professions, labour market demands for skills and competences and developing human capital and knowledge in national strategically important areas.
- R.1.4.6 Timely and rigorous *accreditation and reaccreditation* of higher education institutions and study programmes.

3.A.5 Evidence-based policy making

Data on performance of higher education and research sectors tends to be scattered among various sources and is often not detailed enough to inform effective evidence-based policy making. The Statistical Yearbooks include basic statistics on both sectors, however, the data categories do not always correspond to data categories used in international statistical databases, especially Eurostat (although twinning of these is already contributing to improvements here; there is also new comparative data for the Eastern partnership countries on education) or OECD (it would be excellent to have more data as the one reported, for example, in the OECD Education at Glance). Data related to the role of higher education in competitiveness, higher education aspects of science policy and human capital developments

can be found in reports from international organisations (UNESCO, World Bank, World Economic Forum). In general, a repository of system data on higher education and research needs to be diligently aligned with the international statistical databases to allow for comparability and benchmarking.

This author has not found **open-access comparative data on basic characteristics or performance of individual higher education institutions and research institutes.** Perhaps such data exists in Armenian language. In any case, with the new national integrated system of education data collection it such data will become available and should also be publically accessible.

This author also missed **an easily accessible and updated public repository of all key legal and policy texts in the areas of higher education and science.**

There is no shortage of analyses into various aspects of higher education sector conducted mostly by foreign experts through collaborative projects (as for example those funded through EU TEMPUS programme) or by international organisations (such as UNESCO, World Bank, Council of Europe, Open Society Foundation, etc.). Again, the reports from such projects are scattered on the web. For knowledge-sharing and better utilisation it would be advisable to have one **central knowledge repository which would collect in one place and make openly accessible all studies, analyses and recommendations into reforms of higher education and research in Armenia**. Such repository would be helpful also in planning future development research at home or with assistance of international organisations.

In any case, the Government needs to provide coordination, monitoring and evaluation of impact of the various projects analysing or intervening into higher education and science system commissioned by foreign donors to **ensure that there is complementarity and coherence in purposes, to avoid repetition or efforts and yield genuine added value and to allow for open knowledge sharing**. This means that the various simultaneous initiatives are monitored not only by the funders, but also by the Government to ensure that they achieve programme objectives as well as policy objectives set by the Government.

Several countries have outsources research into higher education and science for purposes of delivering evidence and intelligence (including future scenarios and foresight) for policy making to research institutes within universities or independent research institutes. For example, CHEPS - Center for Higher Education Policy Studies at University of Twente, Netherlands or DZHW - German Centre for Higher Education Research and Science Studies have long performed such function. Typically such centres conduct a variation of basic research, applied research and consultancy and serve not only national authorities (and possibly other stakeholders), but also join international initiatives. Given the absence of similar research centres in the

region, **there is a niche to be explored for Armenia to develop consultancy in research into higher education and science reforms for neighbouring countries along with providing services for national needs to supplement foreign consultancy**. With experience of leading the Bologna Secretariat, a good network of Higher Education Reform Experts, and several highly experiences and competent experts in higher education institutions and various government bodies, there exist – in my view – sufficient national capabilities in this area which could be organised for such purpose. Alternatively a research unit is developed within the Government or ANQA.

The introduction of an integrated information system that will provide system data and analysis for policy making (financed by the World Bank) is a most welcome development as it ensures that universities' primary data collection streams feed into one integrated data warehouse with correlated methods and tools, synchronised collection schedules, corresponding reporting tools, unified data categories, nomenclatures and terminology used and convergent validation procedures. Such system can drive standardisation of data collection procedures at universities (for analysis of effects of such systems on universities in Central and Eastern Europe see Klemenčič et al., 2015).[29]

However, there are several challenges in establishing an effective system. One challenge is whether the system is comprehensive enough as to include not only data on educational aspects of university operations, but also on research and technology transfer, and basic resources and operations (such as property, human resources, etc.). In short, the set of indicators should be developed by the Government jointly with the institutions (or their representative body, such as Rectors' Conference) and with involvement of other relevant bodies, such as ANQA and State Committee on Science. These indicators should reflect the variety of reporting requirements the institutions have not only towards the Government and governmental bodies (including the National Statistical Agency), but also other bodies, such as ANQA and external reporting requirements to the international ranking bodies (so that reports to these are readily available from the data collected).

Second challenge is in helping the institutions to set up their internal institutional research unit, train the personnel, acquire the needed software and set up the internal procedures for data collection. For this purpose, training (and retraining) of personnel (institutional researchers) from higher education institutions – on data collection, reporting and analyses for institutional strategic planning - is a necessary aspect along with regular updates to the software. Ideally, data would be streamed from the institutions into the national integrated system at regular intervals or continuously. On

[29] KLEMENČIČ, M., ŠĆUKANEC, N., KOMLJENOVIČ, J. (2015). Decision Support Issues in Central and Eastern Europe. In Karen Webber and Angel Calderon (eds.) Institutional Research and Planning in Higher Education in a Global Context (Chapter 6, pp. 71-85). Routledge Press/Taylor & Francis. http://scholar.harvard.edu/manja_klemencic/ns

the user-side, the system should be accessible not only by governmental bodies, but also linked directly to ANQA. Institutional research generally includes the following co-dependent functions: 1) Data Development and Maintenance on Core University Functions; 2) Enrolment, Personnel and Financial Management; 3) Outcomes Assessment, Program Review, Accreditation; 4) Institutional Reporting and Analysis, and 5) Strategic Planning.

Recommendations

R.1.5 Higher education and research data management system and knowledge to support policy-making

- R.1.5.1 Fully employing data from the *national integrated system for education data management* (supported by the World Bank) in policy making; adjusting reporting arrangements with higher education institutions in view of this new integrated education data management system. The type of data collected should be frequently reviewed as to ensure that structural changes in the system are reflected and also to develop linkages between higher education institutions' performance in education with that in research and in third mission.
- R.1.5.2 Supporting higher education institutions in developing their *institutional systems of data collection* for purposes of mandatory reporting, accreditation and quality assurance, and to support their own strategic management function and linking these institutional management information systems with the national integrated information system; ensuring ongoing software expansion and upgrades.
- R.1.5.3 Creating a publically-accessible *central knowledge repository* of all legal texts and policies, data on basic characteristics of all higher education institutions (including all study programmes offered) and analyses and studies on different aspects of higher education and science at ANQA or the Government's website.
- R.1.5.4 Strengthening the *Ministry's coordination, monitoring and evaluation of impact of the various projects by foreign donors*, which seek to analyse or intervene into higher education and science systems; ensuring that there is complementarity and coherence in purposes among these projects, to avoid repetition of efforts, to yield genuine added value and to allow for open knowledge sharing. This means that the various simultaneous initiatives are monitored not only by the funders, but also by the Ministry to ensure that projects achieve programme objectives as well as policy objectives set by the Government.
- R.1.5.5 Exploring options *to upgrade the Ministry's research capacities in the areas of higher education and research policy* either by building internal

capacity in this area, or within ANQA, or outsourcing the task to a research unit within a university or research institute. A possibility to form *a regional research centre into higher education and research* could be explored in view of conducting applied research for Armenian policy making, offer consultancy services to higher education institutions and other stakeholders, and to conduct basic research. Such services could be extended to neighbouring countries where similar services are also performed mostly by foreign experts.

B. Structure of the higher education system

3.B.1 Structure of the higher education system

In 2012, there have been 26 state higher education institutions: 16 'with their 14 branches' belonging to the system of the MoES; 4 'founded by interstate agreements and state participation, and funded by 'MoES; 2 'in the system of the Ministry of Defence'; one in each of the Police, Ministry of Emergency Situations, Civil Service Council, Mother See of Holy Etchimiadzin, and 41 private institutions (European Commission, 2012, 4).[30] It is clear from various reports that the number of private institutions has been reduced significantly with rigorously applying licensing and accreditation rules. These numbers vary a bit from the World Bank report (2013). **It would be helpful for students and general public (as well as researchers and policy analysts as myself) to have public access (at ANQA and/or Ministry website) to an up-to-day list of all accredited higher education institutions – private and public and with special status as defined above; with stated basic characteristics (such as number of students and academic staff, etc.) and location (or locations in case of branches) 9n Armenian and a foreign language.**

This relatively high number of higher education institutions is organised into a unitary structure of the higher education system meaning that the sector is not divided into two functionally differentiated institutional types (i.e. universities, which are academically oriented and polytechnics, which are professionally and vocationally oriented). There are four types of higher education institutions in the Armenian higher education system, among which three types are not clearly functionally distinguishable.

Table 9 Types of higher education institutions in Armenia

1) Universities that provide higher, postgraduate and supplementary education in different areas and specialisations; 2) Research institutes that conduct specialised and postgraduate academic programs in a number of scientific, economic and cultural areas; 3) Academies (educational) that offer training for qualified specialists in a specific field as well as postgraduate academic programs; 4) Conservatories that provide qualification development and postgraduate academic programs. They main aim is to train specialists in the field of music.

[30] European Commission (2012) TEMPUS Country Fiche "Higher Education in Armenia", Education, Audiovisual and Culture Executive Agency (EACEA), July 2012.

In unitary systems, the institutions might be ordered according to the level of degrees that the institution confers. Another way of ordering institutions is functionally, on the basis of specialisation of study programmes they offer (such as law, medicine, military schools, etc.). Institutions (or sub-institutional units) educate students for different occupations, relate to different segments of labour market, create professional ties with different industry segment and business and have relationships with different professional groups. Finally, within systems where institutions are under common legislative and budgetary system, there is pressure for more hierarchical ordering on the basis of prestige and quality, even though the definitions of academic excellence and measures of it vary across the specialisations.

There are different models in Europe as to the types of higher education systems. Some countries, such as Finland, Netherlands, Switzerland and Austria have firmly consolidated binary systems, whereas others, such as the UK upgraded its polytechnics to universities in 1992 thereby creating a formal unitary structure. In binary systems, signs of drifts were noted by scholars. Universities have tried to better adapt to the labour market needs and begun to offer more vocational/professional programmes. Polytechnics tried to emulate universities in research and otherwise strived to obtain the status of universities as these had better reputation and better access to academic resources. In some countries, such as Finland, polytechnics have changed their designation to universities of applied sciences to better reflect the aspirations and the institutional changes. A trend in binary systems has been to improve permeability between the two tracks (academic and vocational), to add more professional orientation in universities and more research in polytechnics (and the right to confer PhD - third Bologna cycle degrees), and in general to foster cooperation between both types of institution even to the point of alliances or mergers. We no longer see a trend toward trying to impose binary structure from a unitary system. In fact, the trend is towards blurring the boundaries between institutional types. In many countries which have had a clear binary divide, the trend has been to encourage strategic university-polytechnic alliances (see, for example, Finland).

Attempting to create binary system in Armenia is neither politically feasible nor functionally desirable. So this study does not advocate such restructuring. However, there are three weaknesses in the system that needs to be addressed:

1) the number of higher education institution and research institutes;

2) institutional profiling of higher education institutions, and

3) number of study programmes and programmatic differentiation.

National systems of higher education require some form of mission differentiation among its network of postsecondary institutions. Smaller

higher education systems and especially those under financial austerity regime, structural development of higher education institutions needs to be seriously considered and accordingly steered from the government. The objective is to have a clearly differentiated higher education system where on the one hand each institution has specific characteristics with clearly defined missions and purpose. On the other hand, institutions need to be incentivised to pool resources (academic staff, classroom and research facilities, libraries, and student support services) and enable economies of scale through mergers or other forms of formal cooperation. Finally, a number of study programmes needs to be sensibly matched with recognised professions to have sufficiently differentiated programmatic offer system-wide and to enable better aligning programmatic offer to labour market needs.

3.B.2 System restructuring for efficiency and excellence: mergers and formal cooperation

There are many examples from other small countries which have undergone significant restructuring of their higher education and research systems and considerably reducing number of universities. For example, Denmark has at present eight universities, established in 2007 on a basis of mergers between some universities and government research institutes: 25 universities and research institutions were reduced through mergers to eight universities and three research institutes (Pinhero et al, 2016;[31] EUA, 2014). The mergers between universities and between universities and government research institutes were carried out in order to strengthen the university and research sector, especially in an international setting. The purpose of the mergers between universities and sectoral research institutes was to integrate applied or problem-oriented research into the universities, connecting it better with higher education and research prevalent at the universities. It must be noted, however, that the integration between universities and research institutes took several years and were not without challenges (organisational overload). Restructuring of the HE landscape has also occurred in Switzerland, where the seven public universities of applied sciences were created in 1997 through mergers of existing professional, mostly mono-sectoral tertiary education schools.

In view of its small size and relatively low public and private expenditures for higher education, Armenia has a high number of higher education institutions. Such fragmentation of the sector results in dispersion of resources into small institutional units which do not allow for economies of scale and in the present situation also do not provide good regional coverage. A map with

[31] Pinhero, R., Geschwind, L and T. Aarrevaara (2016) Mergers in higher education. European Journal of Higher Education 6(1) 2016.

location of higher education institutions inevitably shows high concentration in Yerevan and neighbouring regions. At the same time, the universities have a weak research infrastructure, while significant part of overall research is conducted in the research institutes outside which formally fall under the framework of National Academy of Sciences. While informal links certainly exist between these various institutions and researchers often work both in the universities and the institutes, the current situation nevertheless bring several disadvantages. For one, research cannot systematically inform teaching if research activity conducted at university is limited or inexistent. Opportunities for students to take part in research are limited.

These perceived weaknesses in the system need to be tackled on multiple levels. One is the decision whether and how to incentivise institutions towards mergers or other forms of formalised, institutionalised cooperation; thus decreasing the overall number of higher education institutions. The other question is how to establish mergers or formal cooperation between universities and research institutes, which on the one hand potentially also decrease the number of institutions and on the other hand boost research function of universities, which is currently perceived as one of major weaknesses in the system (see section "Research").

Mergers and system restructuring are increasing across Europe as a result of funding cuts (e.g. Finland, Sweden, Germany, Belgium, Poland, Hungary and several other contemplating) (EUA, 2014).[32] In Denmark, Estonia, Finland, Norway and Latvia universities have absorbed smaller public non university institutions to optimise costs through economies of scale. Other mergers are driven by the ambitions to build their global competitiveness in education and especially research excellence. The system restructuring takes into consideration more even regional distribution and strengthening their roles in regional labour markets and providing research and other services to regional economies. Restructuring of the system (i.e. mergers between universities or universities and research institutes etc.) following a very clear long-term strategy creates a more concentrated system. Through mergers resources for higher education and research can been concentrated to a more limited number of universities and public research institutes. Given the sensitivity and the strategic importance of the task at hand, system restructuring policy needs to be properly communicated to the entire higher education and research systems.

Mergers are, however, not the only option to achieve benefits of reduced cost and pooling of resources; they are the most far-reaching and also most demanding form of inter-institutional cooperation. In merger two or more

[32] EUA - European University Association (2015) DEFINE thematic report: university mergers in Europe by E. Bennetot Pruvot, T. Estermann and P. Mason. Brussels: European University Association; http://www.eua.be/Libraries/define/2define-thematic-report-2-university-mergers-in-europe_final.pdf?sfvrsn=0

partner institutions join together in forming a single institution, which may retain the name and legal status of one of them or become an entirely new legal entity. There are variations in this model where subsidiaries of one of the partners can retain – to different degrees - separate names and operations or a federation which is a more flexible form of a merger. Other possibilities for formalized and institutionalised cooperation between universities and between universities and research institutes include consortia (alliances), and various forms of formalised collaboration. In consortia partners collaborate in wide range of areas and operations and pull resources and share facilities, but retain their separate legal identities and names. In formalised collaboration two or more institutions cooperate in a particular area, such as a joint degree programme or module or course, a joint faculty or graduate school, a joint research institute, or a joint research project. The terms of collaboration are typically specified through a cooperation agreement.

Table 10 Organisational conditions to be considered in structural development of higher education institutions

1) A higher education institution is large enough to allow for cross-disciplinary education, has strong units with well-developed programmatic offer and clear research profiles, is internationalised and provides excellent student services.
2) Universities and research institutes can create joint departments.
3) A higher education institution has close cooperation with local business, industry, civil society organisations and other education institutions (schools, high-schools, vocational and training institutions) to nurture entrepreneurship and innovation, and aid local and regional development.
4) There is a clear programmatic differentiation within institutions between the professional-vocational oriented study programmes and academic study programmes.

Formalising inter-institutional collaboration is a timely and challenging task as it includes consolidating management and administrative procedures, ICT systems as well human resources rules and regulations. Consolidating the structures of remuneration of academic and scientific staff and streamlining their career (progression) paths is one of the essential tasks in such reforms. Geography and distance have been noted as possible constraints to the effectiveness of mergers. Inter-institutional cooperation should be explored in particular within regions (for example among university branches), where research capacities are even weaker or inexistent.

3.B.3 Institutional profiling

Both funding arrangements, and accreditation and quality assurance need to be revised to incentivise institutions towards profiling and strategic development. While institutions already hold considerable organisational and financial autonomy, a proper balance needs to be found in terms of steering, but not over-steering the organisational development. If left completely to their own devices, institutions tend to mimic the best national performers, resulting in isomorphism rather than in institutional diversity at the system level. If institutions are funded in exactly the same way for the same outputs, then they will inevitably seek the same ways of maximising their income through this provision. Similarly, the accountability requirements that go with a reasonable level of institutional autonomy also tend to breed the same responses to the uniform requirements of the system. At best a uniform funding regime can be said to do nothing to encourage institutional diversity, in spite of the ideologically driven contention that autonomous institutions operating in a competitive market will automatically diversify if given sufficient independence.

Government is in the best position to determine where national priorities in higher education and research lie. At the same time, institutions themselves are in the best position to determine where their institutional comparative advantages lie and what possible directions of institutional development could be. Hence, the decisions need to be discussed and agreed jointly by the Government and the individual higher education institutions on such critical strategic measures such as developing institutional profiles – i.e. areas in which the institutions wishes to build its competitive advantages in teaching, research and third mission - , i.e. areas of teaching, research and third mission, and formal cooperative arrangements between higher education institutions – e.g. mergers, joint programmes, joint research centres, etc.

There are numerous examples from around the world as to how public funding arrangements have been organised to help the higher education sector to be more diversified and to contribute effectively to national priorities (Benneworth et al., 2015).[33] In countries where quality improvement of education has been put forward as one of the key priorities of the government, the most likely measure has been toward some sort of performance-based funding. Such measure had two major implications.

1) One, a clear and transparent monitoring and assessment framework to measure quality and performance needed to be set up in relation to funding arrangements. The key question in such framework is, of course, which indicators to include and how to ensure validity of both indicators and

[33] Paul Benneworth, Harry de Boer & Ben Jongbloed (2015) Between good intentions and urgent stakeholder pressures: institutionalizing the universities' third mission in the Swedish context, *European Journal of Higher Education*, 5:3, 280-296.

measurements. Collaboration between the government and the higher education institutions to set up reliable, standardised methods of data collection and to feed this data into an integrated national system (data repository), as discussed above, is of essence here. Examples of countries which created such system suggest that standardisation and upgrade of data collection system on national level drives standardisation and upgrade of collection systems (and entire institutional research function) on institutional level (Klemenčič et al., 2015). In Austria, for example, the list of indicators was agreed between the Government and the representatives of Rector's Conferences. In Hong Kong, institutions provide their own indicator framework with quantitative and qualitative indicators to be assessed by the University Grants Committee (Benneworth et al., 2015). National surveys of student experience or satisfaction and explorative measures of learning outcomes (variations of Collegiate Learning Assessment (CLA) or OECD's AHELO) have also been added to such indicators.

2) Second aspects are then performance agreements or mission agreements which crucially define state-institution relationships by specify the terms of public funding arrangement between the government and the institution. If system diversity is an objective, then, of course, these agreements should not include exactly the same indicators and targets for all institutions, but there should be a fair share of individualised targets reflecting specific objectives agreed between the government and the institution. These specific objectives may reflect a number of possible national priorities, such as to make system more diverse or to improve institutions' impact on regional development or to achieve an optimal size of institutions (through mergers or otherwise) or to create centres of world-class research (like the Excellence Initiative in Germany). Here, support measures might be needed to help institutions to strengthen strategic management skills of senior staff along with institutional research as discussed above.

Recommendations

R.2.1 Higher education system efficiency

- *R.2.1.1 Fundamental review of the structure of higher education system* is needed in view of *reducing the number of higher education institutions and research institutes* (by mergers or accessions or other forms of formal cooperation), enabling and strengthening formal cooperation between research institutes and universities and providing for more even regional coverage of higher education institutions (which also have research function). Furthermore, uniting state organisations of similar scientific direction which work under various ministries; at least some of them can be moved under the universities or relevant scientific organizations. Concretely this implies the need for steering higher education institutions towards pooling (concentration) of resources and achieving economies of

scale through mergers or other forms of formal cooperation. Such reforms require also that the structures of remuneration of academic and scientific staff are consolidated and that their career (progression) paths are streamlined.

- R.2.1.2 Continuing to apply diligently *licensing and accreditation procedures* for both public and private institutions as well as maintaining rigorous licencing, accreditation and quality assurance procedures for foreign higher education providers in Armenia and put these mechanisms in use towards more institutional and programmatic diversity and institutional profiling.
- R.2.1.3 Encouraging *institutional profiling and institutional positioning* whereby higher education institutions develop distinct missions and purposes based on their comparative advantages or areas of special national interest. The incentives for profiling and positioning typically come from performance-based funding and through QA and accreditation procedures.

3.B.4 Number of study programmes and programmatic differentiation

The number of study programmes needs to be sensibly matched with recognised professions to have sufficiently differentiated programmatic offer system-wide and to enable better aligning programmatic offer to labour market needs. If there is too large a discrepancy, this indicates fragmentation and existence of programmes that operate in a self-referential way and there might be obstacles in permeability between bachelor's and master's programs. In other words, the recommendation is not to overspecialise the bachelor's programmes but structure them in a way to allow transition to master's programmes of other universities in related fields. Furthermore, there should be a distinction made in the programmatic offer within each institution as to the more academic study programmes and those that have stronger professional and vocational orientation.

Recommendations

R.2.2 Reform of study programmes

- R.2.2.1 *Reducing the number of study programmes to avoid duplication beyond healthy competition and to match recognised professions* to have sufficiently differentiated programmatic offer system-wide and to enable better aligning programmatic offer to labour market needs (see also below under funding).

- R.2.2.2 Preventing higher education institutions *from overspecialising the bachelor's programmes* but to structure them in a way to allow transition to master's programmes of other universities in related fields.
- R.2.2.3 Steering higher education institutions to making *a distinction in the programmatic offer* between the more academic study programmes and those that have stronger professional and vocational orientation as to allow students to make an informed choice matching their expectations.
- R.2.2.4 Supporting *programmatic profiling* at higher education institutions and promotion and *expansion of selected competitive and innovative study programmes*.
- R.2.2.5 Introduction of *new contemporary professions* with the purpose of imparting narrow specialization of study programmes at higher education institutions.
- R.2.2.6 Reorganisation and revision of study programmes to better match the recognised professions, labour market demands for skills and competences and developing human capital and knowledge in national strategically important areas. All study programmes need to be revised so as to be based on learning outcomes and in line with the national framework of qualifications.

Missing data

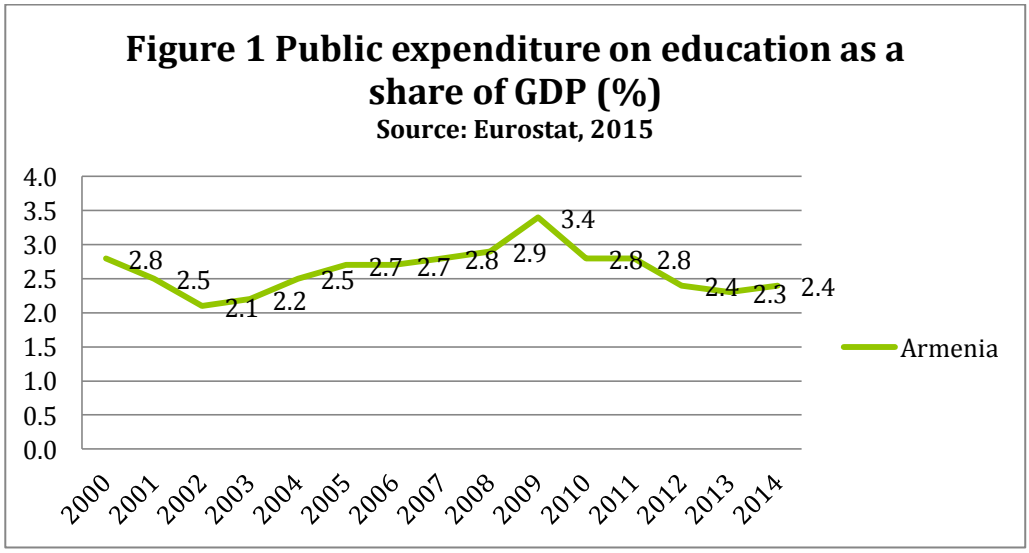
1) List of all higher education institutions, per type, per ownership, number of enrolled students per cycle, number of academic staff, number of other staff
2) Regional distribution of higher education institutions
3) List of all study programmes (compared to recognised professions)
4) Study programmes per higher education institutions, number of students enrolled

C. Funding and access

3.C.1 Public expenditures for higher education: financial sustainability of sector

Armenia's public spending on education is low by international standards, including and especially investments in higher education. The sector faces significant cuts in the aftermath of the economic crisis which hit Armenia in 2009 and education spending continues to decline in the immediate future, which makes Armenia one of the lowest spending countries in the region; and spending for higher education being the lowest in the region. The distribution of funding within the education sector favours lower education levels, in particular after the reform implemented in the general education sector making three-year upper secondary schools (grades 10 to 12) free.[34] In addition, public research funding is mostly allocated to the Academy of Sciences, which further stripes universities of possible funding for research. Armenia's high dependence on private funding is extreme and among the highest in the world.

Figure 1 Public expenditure on education as a share of GDP (%) (Eurostat, 2015)

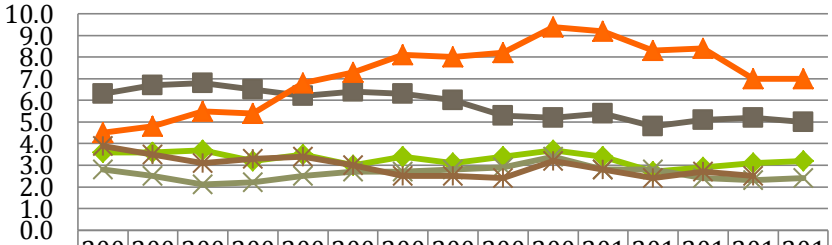


[34] Form funding models see: EUA - European University Association (2014) DEFINE thematic report: funding for excellence by Bennetot Pruvot and T. Estermann. Brussels: European University Association; http://www.eua.be/Libraries/define/1define_funding-for-excellence.pdf?sfvrsn=7

Figure 2 Public expenditure on education as a share of GDP (%) – comparative for Eastern partnership countries (Eurostat, 2014)

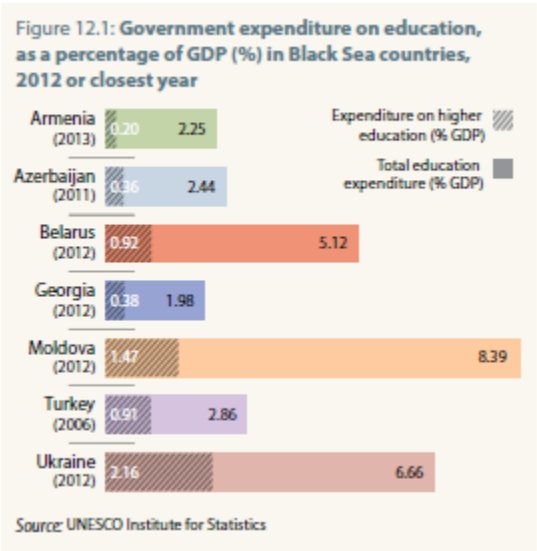
Figure 2 Public expenditure on education as a share of GDP (%) - comparative for EaP countries

Source: Eurostat, 2015



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Georgia	3.6	3.6	3.7	3.2	3.5	3.0	3.4	3.1	3.4	3.7	3.4	2.7	2.9	3.1	3.2
Belarus	6.3	6.7	6.8	6.5	6.2	6.4	6.3	6.0	5.3	5.2	5.4	4.8	5.1	5.2	5.0
Moldova	4.5	4.8	5.5	5.4	6.8	7.3	8.1	8.0	8.2	9.4	9.2	8.3	8.4	7.0	7.0
Armenia	2.8	2.5	2.1	2.2	2.5	2.7	2.7	2.8	2.9	3.4	2.8	2.8	2.4	2.3	2.4
Azerbaijan	3.9	3.5	3.1	3.3	3.4	3.0	2.5	2.5	2.4	3.2	2.8	2.4	2.7	2.5	

Figure 3 Government expenditure on higher education as a percentage of GDP (%) in Black Sea countries for year 2012 or closest (UNESCO Institute of Statistics in UNESCO Science Report, 2015)

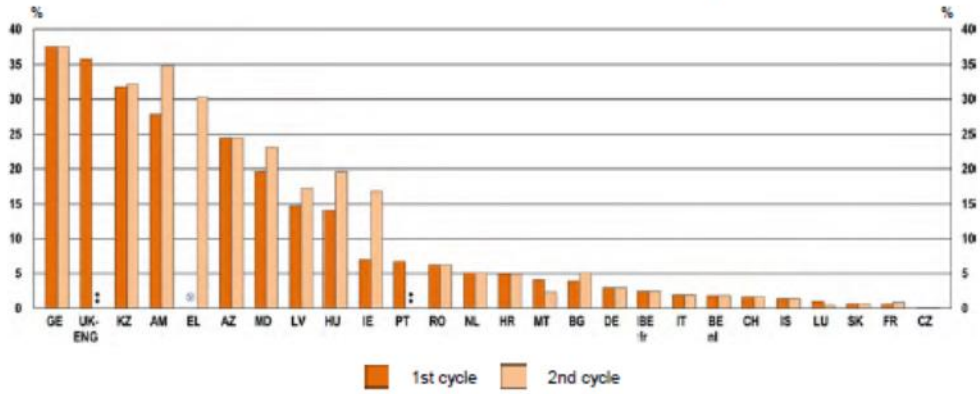


Relative to the countries' GDP per capita, tuition fees in Armenia are among the highest fees among EHEA countries for first and second cycle students (European Commission/EACEA/Eurydice, 2015).[35]

Figure 4 Tuition fees as percentage of GDP per capita (2013/14) (European Commission/EACEA/Eurydice, 2015, 132)

Figure 4.17 presents the most common amount of yearly fees in the first and second cycle as percentages of GDP per capita (2013 value) for countries where data were available. As the figure shows, where there is a difference between the cycles, typically second cycle students pay more fees than first cycle students (except in Malta and Luxembourg). The biggest difference between the cycles is in Ireland.

Figure 4.17: Most common amount of yearly fees for full-time students as a percentage of GDP per capita, 2013/14



	GE	UK-ENG	KZ	AM	EL	AZ	MD	LV	HU	IE	PT	RO	NL
1st cycle	37.6	35.8	31.7	27.9	no fees	24.5	19.6	14.8	14.1	7.0	6.7	6.3	5.1
2nd cycle	37.6	:	32.3	34.8	30.3	24.5	23.2	17.2	19.6	16.8	:	6.3	5.1
	HR	MT	BG	DE	BE fr	IT	BE nl	CH	IS	LU	SK	FR	CZ
1st cycle	5.0	4.1	3.9	2.9	2.4	1.9	1.8	1.6	1.4	1.0	0.6	0.6	0.1
2nd cycle	5.0	2.3	5.1	2.9	2.4	1.9	1.8	1.6	1.4	0.5	0.6	0.8	0.1

Notes:

Data are sorted based on yearly fees in the first cycle.

Source: BFUG questionnaire and World Bank.

Generally, the public sector funds education either by bearing directly current and capital expenditure of educational institutions (direct expenditure for educational institutions) or by supporting students and their families with scholarships and public loans, as well as by transferring public subsidies for educational activities to private enterprises or non-profit organisations (transfers to private households and enterprises).

[35] European Commission/EACEA/Eurydice (2015) The European Higher Education Area in 2015: Bologna Process Implementation Report. Luxembourg: Publications Office of the European Union.

Recommendations

R.3.1 Financing of higher education

- R.3.1.1 Reviewing different *models for long-term sustainable financing* of higher education in Armenia and finding appropriate balance between public and private funding of higher education institutions' operations in education, research and third mission (along the principle of diversification of funding sources).
- R.3.1.2 *Increasing public funding for higher education* when – in the long run - economic (and tax) circumstances improve. Consideration should be given whether some initial tax exemptions for universities' commercial activities might be a possible instrument to stimulate this function (while also ensuring that legal status allows all institutions to independently decide on this issue; i.e. status of foundations) or such incentives might be possible to achieve other goals, such as steer restructuring towards mergers.
- R.3.1.3 *Remuneration of academic staff and researchers* needs to be reviewed and some general guidelines agreed on national level as to ensure that their remuneration is adequate for a middle-class standard of living (otherwise the best and the brightest will emigrate, choose other better-paying professions or have several simultaneous employments which impairs their quality of teaching and reduce their research). Funding programmes that acknowledge and promote individual scientists' research excellence are beneficial and need to be conducted transparently, with fair distribution across disciplines and with full involvement of scientific community in developing criteria of scientific excellence which need to match the disciplinary practices of scientific productivity.

3.C.2 Public funding of higher education institutions

The government allocates lump-sum funding to public universities. Only public universities are eligible for state funding. The government decides each year the number of specialists that the country needs (or can afford to train) and allocates money (scholarships) to universities for this task. About one third of all students studies for free and the rest pays tuition fees. About 90% of all scholarship holders also receive a small monthly stipend. Entrance to these free study places is based on performance at the university entrance exams or grade 10 school leaving exams. The scholarship is merit based and the student can lose scholarship if they do not perform at the top of the class next year. The monetary value of the scholarship is calculated in the Ministry of Economy annually based on a set of normatives, which include student-

staff ratios, academic staff salaries and operational costs. The government has set normatives for assumed student-teacher ratio and non-teaching staff and teacher ratio. The specialization agreements are finalized through a negotiation procedure between the government and a university. The allocation is however based primarily on historical trends and no significant changes occur over years. The government provides highly limited funding for capital investment and research through the State Committee of Sciences, so higher education institutions finance capital investments primarily from own revenues to meet licensing requirements. Universities obtain only around 20-30% in state funding and the rest from private resources, primarily tuition fees. Universities are autonomous in setting the rate of tuition fee and the number of fee-paying students that will be admitted, but from 2015 the maximum level of student tuition fees was defined and approved by the government. The annual tuition fees amount to AMD 200,000 to 700,000 (EUR 360-1,250 and are higher at public (more prestigious) than private institutions and higher for more highly demanded programmes (PL4SD, 2014).[36]

Despite the attempts to support certain fields of study and areas of the economy through the student allowance system, one major issue of the higher education financing system is the rather weak link between the higher education system and the labour market. According to the website of the Center for Education Projects PIU, the distribution of state-funding does not reflect the demand for graduates in prioritised areas of the national economy. In order to support national development priorities, efforts are made to develop pro-found estimations of the potential demand for graduates in the priority sectors of economy as a basis for purposeful distribution of state-funding (EV Consulting, 2012;[37] PL4SD, 2014).

Higher education institutions pay taxes on profit from any incomes, including tuition fees, and fees on other educational services.

Recommendations

R.3.2 Public funding of higher education institutions

- R.3.2.1 *Performance-based funding arrangements*[38][39] for higher education institutions should be developed in a way that it creates incentive for

[36] PL4SD (2015) The PL4SD Country Reviews: Peer learning in practice, Institute of Advanced Studies (IHS), 2015.

[37] EV Consulting (2012) Public support to higher education in prioritized areas of economy, EV Case study, Yerevan, 2012.

[38] For models of performance-based funding in Europe see EUA - European University Association (2014) DEFINE thematic report: Performance-based funding of universities in Europe by A.-L. Claeys-Kulik and T. Estermann. Brussels: European University Association; http://www.eua.be/Libraries/define/3define-thematic-report_-pbf_final-version.pdf?sfvrsn=0

[39] See also recommendations prepared by CHEPS (2008) Formulating the Financing Principles and Exploring Alternative Financial Mechanisms for Armenian Tertiary Education, World Bank, 2008

higher education institutions to profile their educational, research and third mission offer. Performance indicators need to be defined in accordance to the institutional mission and profile and taking into consideration all three functions: education, research and third mission. Performance-based funding agreements should be implemented also for research institutes which offer study programmes along with performance indicators for research function.

- R.3.2.2 Reviewing the number of *publically-funded specialisations* to respond to the number of recognised professions, the labour market needs and national economic priorities. Targeting financing of study places to study programmes which are in priority areas for Armenia's development (as indicated in the Armenia Development Strategy).
- R.3.2.3 *Ensuring transparency in the funding relationship* between the government and higher education institutions.

3.C.3 Equity in access

The equity dimension refers to disparities in the results (attainment and academic trajectories) of potentially disadvantaged groups such as low-income groups, females, ethnic minorities, and people with disabilities. The government finances state-funded places for narrowly defined specializations in state HEIs, primarily on a merit basis with a limited number for socioeconomically vulnerable students. Five categories of students are exempt from the tuition fee: two-sided orphans, disabled persons, children of deceased freedom-fighters, students detached for target study at the request of local self-governance bodies, and students disabled during fixed-period mandatory service.

Strategy on Financing Higher Education in the Republic of Armenia education financing system has provided for more targeted and effective state programs aimed at state financial support of students, including a) professional scholarship program, b) student financial support program, c) allowances for socially vulnerable and special group students, d) program on special scholarships for best progress students (World Bank, 2013, 113). It also envisaged to: a) bring the amount of student scholarships and financial support in line with tuition fees, b) revise the current state policy of setting quotes of student admission and provide state quotes to professions of priority importance for the state (ibid.). The amendment of the Law on Higher and post-Graduate Professional Education dated May 19, 2014 (Law No.23) has made student support more widely accessible. Newly, higher education institutions have to provide at least 7% of the budget gained from tuition fees in form of full or partial tuition fee refunds to at least 10% of the students studying within non-state funded higher education. As a result, the share of students receiving full or partial tuition fee reimbursements either by the state

or by the HEIs could be raised to about 20% of the total student population. The reimbursements are granted on the basis of academic performance and the socioeconomic status of the students. Amongst others, following groups may receive tuition fee reimbursement: students who are socially disadvantaged, students without parental care, students with disabilities, students with children under one year of age, students within compulsory military service, and students with two or more siblings (under age or within education) (PL4SD, 2014). The Armenian higher education system does not have a student loan system, which would be subsidised significantly enough by the government to make student loans widely accessible.

The admission system is administered by the National Assessment and Testing Centre (NATC) and covers all state higher education institutions and most private institutions. The external examinations are controlled and scored centrally - beyond the influence of secondary or higher education institutions. As part of the admission procedure, all applicants fill out a list of study programmes they want to apply to - ranked by their individual preferences. The application has to contain information about preferred study programmes and higher education institutions as well as the preferential mode of tuition-fee coverage (self- or state-funded, see chapter 3.C.1 for more information about tuition fees and state-funded study places). Everyone who participates in the admission procedure has the right to apply to one or more higher education institutions for a maximum of 8 self-paid and 2 state-funded study places. The admission is based on the examination results on the one hand and on the availability of the preferred study places on the other hand. On the basis of merit, the applicants are admitted to the study place available that is ranked highest by the applicant. Council of Europe report on academic integrity reports that "there appear to be significant issues with the national school leaving examinations. These seem to include systemic inappropriate private tutoring, cheating in final examinations (associated with inadequate invigilation), and narrow approaches to assessment which may increase the 'attractiveness' of inappropriate private tutoring" (Smith and Hamilton, 2015, 9).

Recommendations

R.3.3 Access

- R.3.3.1 Continuing to develop *student welfare support* (including student housing). A consideration should be given whether it would be possible to regulate (put a cap) on the maximum rent charges to students in private accommodation in Yerevan.
- R.3.3.2 Collecting *data on the social background of students* (and clearly define the underrepresented groups) and developing benchmarks on the participation of underrepresented groups in higher education.

- R.3.3.3 Ensuring affordability and accessibility of higher education for various social groups and persons with special educational needs.
- R.3.3.4 Reviewing the *national school leaving examinations* and the reports of systemic inappropriate private tutoring, cheating in final examinations (associated with inadequate invigilation), and narrow approaches to assessment which may increase the use of inappropriate private tutoring.
- R.3.3.5 Encourage higher education institutions to develop *outreach activities at secondary schools* (ideally by involving also employers) to inform students at secondary school about programme offer and organising educational (and informational) activities for secondary students at higher education institutions.
- R.3.3.6 Creation of *dormitories for foreign students*.

D. Education

3.D.1 Quality of teaching, learning and assessment – student centred approaches in higher education

Quality teaching in higher education, whether in highly applied or academic fields of study or in the hard sciences or the humanities, requires that teachers are following and actively contributing to the knowledge base in their fields, conscious of the student-centred approaches in teaching, learning and assessment, and reflective of their own practices and exploring possibilities to improve contents and methods of their teaching.

Table 11 Central tenets of student-centred approach in higher education (Klemenčič, 2015)[40]

More students' responsibility: student takes responsibility for own learning as opposed to assuming teachers' responsibility and control over students' learning

More students' autonomy: when a student's behavior is experienced as willingly enacted; when student fully endorses the actions in which engaged and/or values expressed by them

Stronger students' efficacy: students' judgment of and belief in their capabilities to exercise control over their own functioning and over events that affect their lives

Cultivating students' self-regulation: the process by which a student controls (makes conscious decisions about) own learning trajectory in higher education and it comprises:

- *forethought* (task analysis - goal setting/strategic planning, and self-motivation beliefs – goal orientation/self-efficacy/interest);
- *performance* (self-control – time management/help seeking, and self-observation – metacognitive self-monitoring/self-recording) and
- *self-reflection*: self-judgement/self-evaluation/self-satisfaction

Teachers:

Teachers' responsibility: Teachers remain co-responsible for students' learning, but not solely responsible and not fully in control as to what and how students learn and how they are assessed. There is shared responsibility.

Teacher-student relationships: There is **interdependence** (indeed partnership) between teachers and students in pursuit of learning, which is based on mutual respect and shared interests. There are ongoing conversations/consultations/collective negotiations on content, method and assessment of learning.

[40] Klemenčič, M. (2015) "The many dimensions of student-centred learning", HERE Conference "Innovating learning and teaching: the next phase of the Bologna Process", organised by the initiative 'Centralised Support for Higher Education Reform Experts in European Neighborhood countries (www.supporthere.org)', 3-4 December 2015, Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia.

Expectations on teachers:
- to design active (vs passive) learning activities
- enable social/collaborative learning
- help develop relationship to discipline – ways of thinking and acting in a particular discipline
- to design formative assessment – to aid learning rather than simply to check acquisition
- to put emphasis on deep understanding, problem-solving, creativity
- to a reflexive approach to teaching (thinking what you do, why you do it, does it work – self-observation, self-evaluation, self-improvement)

Expectations on institutional managers:
Nurture institutional culture that emphasizes quality of teaching and learning and student support
- include teaching and learning excellence, student support services in performance indicators
- require that learning outcomes are fully defined and employed in all study programmes (continuously monitor and periodically review programmes); learning outcomes should be linked to formative assessment
- incentivize, reward and support development and innovation in teaching and learning, student support
- design support systems and spaces for quality teaching and learning – physical spaces, libraries, on-line environments, student support services
- involve students as partners in curriculum planning, QA, student support services, etc.
- incorporate excellence in teaching and learning into institutional profiles, mission, strategic planning, strategic partnerships
- enable flexible learning pathways; formalize flexible study opportunities for 'part-time' students in all stages of life

Expectations on policy-makers:
Monitor and evaluate quality of teaching and learning and student support
- monitor and evaluate students' workload, progression, completion, learning outcomes, student engagement (satisfaction), employability, learning resources and student support across the system
- special status and flexible study opportunities for 'part-time' students?

Support excellence in teaching and learning and student support
- initiate (and support) communities of practice in advancement of teaching and learning within disciplines, within different study cycles (workshops, training events, exchange of practices)
- initiate and support basic and applied research into students-centred approach in higher education and enable wide distribution of findings
- ensure that research funding applications require from applicants to specify (and later demonstrate) how research was used in teaching and learning (e.g. undergraduate students involved in research projects)

One of the most difficult areas concerning educational function of higher education is to measure quality and learning outcomes. Unlike in lower levels of education, where tests such as TIMSS and PIRLS (Boston College's Trends in International Mathematics and Science Study and Progress in International Reading Literacy Study and PISA (the OECD's Programme for International Student Assessment) are widely accepted as metrics for assessing learning outcomes in an international perspective, no such widely-accepted instrument exists yet for tertiary education. To measure quality of education, governments typically use a combination of indirect measures of quality, such as graduation rates, length of study and graduate employability; and some also use national students' satisfaction or engagement surveys to compare student satisfaction/experience across higher education institutions. National students satisfaction surveys have been highly controversial since student experience is measured across higher education institutions which are highly differentiated in terms of their profiles and profile of their students, because the measures of satisfaction are crude measures of actual quality, and because institutions often convince students for positive assessment to protect their brand (which is in turn also beneficial to students who get degree from that institution).

A much more effective and widely accepted intervention into quality of education provision is through accreditation and quality assurance procedures, which follow commonly accepted standards and guidelines and ensure that within each institution and programme quality teaching with innovative curricula is offered and that research enhances teaching. Strong system of quality assurance also helps to offset the effect of global rankings which are ordering the global higher education systems and distribute rewards and incentives based on disputable measures of excellence. As proposed by Douglass (2016),[41] rather than trying to compete in global rankings race, the higher education institutions should strive towards self-improvement towards meaningful engagement in and service to the societies and communities that gave them life and purpose. Governments should prompt the institutions to first and foremost engage and compete nationally. The national higher education system is where their priorities and their locus of activities lie. The proposition made is that the strategic positioning of institutions always begins locally, regionally, nationally and only then moves to global pursuits (Klemenčič, 2016).[42]

To promote quality of education (teaching and learning), higher education institutions have at their disposal a number of measures that have been widely recognised to promote quality such as: Inquiry-Based Learning,

[41] Douglass, J. (ed.) (2016) A New Flagship University: Changing the Paradigm from Global Rankings to National Relevancy (Palgrave Macmillan).

[42] Klemenčič, M. (2016) Reflections on a New Flagship University. In J. A. Douglas (ed.) A New Flagship University: Changing the Paradigm from Global Rankings to National Relevancy (Palgrave Macmillan).

Experiential Learning, Students' Research Engagement; Interdisciplinary Opportunities; Peer Learning, Problem-based Learning, etc.[43] Higher education institutions are also experimenting with on-line courses, blended/hybrid courses, web-facilitated courses, MOOCs, etc. As part of support services, institution offers academic preparation/remedial courses for students coming with weaker academic (and frequently also lower socio-economic) backgrounds.

Undergraduate research engagement based on the idea of research-based learning is becoming an important component of also first-cycle (not only 2nd and 3rd cycle) education, as it not only contributes to skills development and possible contribution to local community projects or organisations, but also helps students to immerse in the disciplinary knowledge and develop networks in professions thereby improving further study or employment opportunities. Involvement of students at all levels in research activities should be encouraged. A simple instrument to stimulate such involvement is to require from all recipients of public research funding to link research activities to teaching and to show how students will be engaged in the funded research project. Quality teaching includes helping students to understand the ways of thinking and practicing the chosen discipline(s), and such understanding includes familiarity with discipline-specific research methods, conducting research and presenting research findings. On the most effective ways of teaching students the ways of research into their discipline is to involve them in their own research or create opportunities for students to conduct research under their guidance and supervision.

Education of Master's and PhD students is an essential aspect of higher education provision. A rule of thumb recommendation in terms of combination of students in different cycles at universities is having 30 to 50 percent of all student enrolment in graduate education, and with an array of masters, doctoral and professional degree programs (Douglass, 2016). Such combination allows also for graduate students playing a teaching or advising role in undergraduate education apart from contributing to the research function. Graduate education is a critical component in developing and supporting professional expertise and knowledge based economies (Douglass, 2016). In many countries, graduate schools have been developed within universities to cater for various educational and research needs of graduate students. Many of the programmes in graduate education are conducted in foreign languages to attract foreign students, enable visiting foreign lectures and to help internationalisation of domestic students.

A trend in many countries is for research universities to strengthen the learning communities through linked courses (students take two interlinked,

[43] See for more in Douglass (2016).

mutually complementary courses often in different disciplines and embedded in different study programmes); learning clusters (students take three or more connected courses, usually with a common interdisciplinary theme uniting them) (Douglass, 2016).

Finally, commitment to positive ethical principles and ethical behaviours is fundamental for quality of teaching and learning (see excellent study by Council of Europe (Smith and Hamilton, 2015, 8): "The teaching and learning relationship between HE staff and students should be based on the fullest commitment to fundamental positive ethical principles and ethical behaviours. These should be embedded in comprehensive codes of ethics. In the case of HE staff, breaches of these codes should be linked to powerful sanctions through contracts of employment. In the case of students, breaches of these codes should be linked to powerful sanctions through HEI regulatory frameworks. HE staff should have a particular responsibility for developing the positive commitment of students to ethical behaviours". The Council of Europe study (Smith and Hamilton, 2015, 8) recommends – and this author concurs – that "The Government of Armenia should support these developments though public awareness-raising campaigns with wider civil society… [and] give full consideration to the extent to which it may be necessary to produce enabling legislation to underpin these developments, and ensure consistent minimum standards in institutional approaches, e.g. by inclusions in a new Law on Higher Education."

Yerevan Ministerial Communique (EHEA, 2015)[44] highlights the priority of enhancing quality of teaching and learning in European Higher Education Area. As in most countries in Europe, further development in this crucial higher education function is needed. Developing student-centred methods of instruction and assessment methods goes hand-in-hand with regular review and updating of study programmes, their expected learning outcomes and content of teaching. One specific objective here has to be **aligning study programmes – where appropriate - with the needs of the labour markets**. There are several concrete measures that can be considered to initiate institutional processes towards excellence in education provision. **The role of ANQA is essential here not only in terms of accreditation of study programmes and institutions, but also in conducting formative external evaluations and providing feedback and consultancy to the institutions on how to improve specific functions**.

In the national systems which are most advanced in the areas of teaching and learning, there is a governmental body designated **to support research – both basic and applied – in the area of teaching and learning, providing professional development opportunities for and certification of academic**

[44] EHEA (2015) Yerevan Ministerial Communique. EHEA Secretariat, 2015.

staff in teaching and learning and create a platform for sharing of best practices (as, for example, the Higher Education Academy in the UK). UK has a related agency, established by the associations of the UK higher education institutions, which is the Leadership Foundation for Higher Education, whose purpose is to develop and improve the management and leadership skills of leaders in higher education institutions. There is no need necessarily to erect new bodies to Armenia to perform similar functions. However, quality of teaching and learning needs to be highlighted in the forthcoming strategy and there should be **a designated coordinating body for excellence in teaching and learning in higher education** (within Ministry or ANQA) which will develop policies and activities, monitor the implementation and coordinate fundraising to support research and development into teaching and learning from foreign donors or elsewhere.

Recommendations

R.4.1 Student centred approaches to teaching, learning and assessment

- R.4.1.1 Strengthening academic integrity and commitment to ethical behaviours in education processes.
- R.4.1.2 Initiating and supporting development and implementation of student centred approaches in teaching, learning and assessment.
- R.4.1.3 Initiating and supporting student involvement in research and innovation (in all cycles, including first cycle). A simple, yet effective instrument to stimulate such involvement is to require from all applicants for public research funding to demonstrate how research activities will be used in teaching and to show how students will be engaged in the funded research project.
- R.4.1.4 The actual teacher-student ratio on system and institutional levels needs to be calculated counting undergraduate and graduate Student Full-Time Equivalents (meaning student with full course-load) and counting Teaching Faculty Full-Time Equivalents. A rule of thumb recommendation is that such ration should not exceed 25 to 1, and a target at top universities tends to be around 16 to 1.

3.D.2 Tertiary education participation and attainment

In 2014, there were 100 854 tertiary education students in Armenia, the number which includes students in Bachelor (first Bologna cycle) and in Master's (second) Bologna cycle) study. In Armenia's Statistical Yearbooks, the PhD candidates are not recorded as higher education students, but as research staff in the science section.

The total enrolments in higher education, including in private higher education institutions (1st cycle), have been gradually decreasing (Figures 5 and 6) in the last five years, while the number of part-time students (Figure 5) and number of master's students (2nd cycle) (Figure 9) has been somewhat increasing since 2009/10. Looking at period 2004 to 2014, the average rate of change for the number of students in tertiary education has been 0.6% (Figure 7). Compared to other countries in the region, Armenia follows similar trend in enrolments to the first cycle (ISCED 5), but lags behind both in terms of the number of students enrolling to the second cycle and due to only minimal increase in enrolments (Figures 8 and 9).

Figure 5 Number of students in Armenian higher education institutions by mode of study (Statistical Yearbook, 2015)

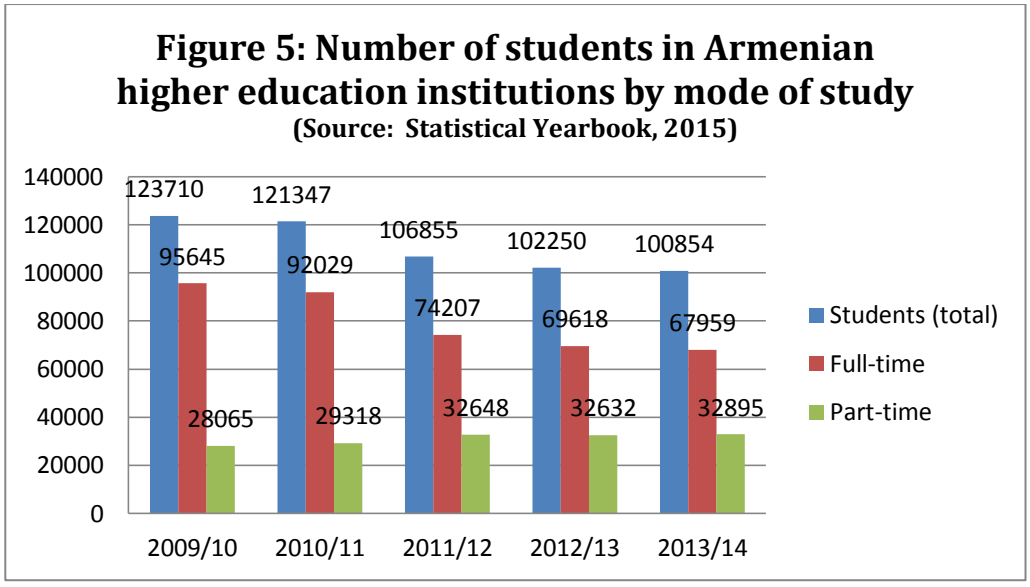


Figure 6 Number of students in Armenian higher education institutions by degree level (Statistical Yearbook, 2015)

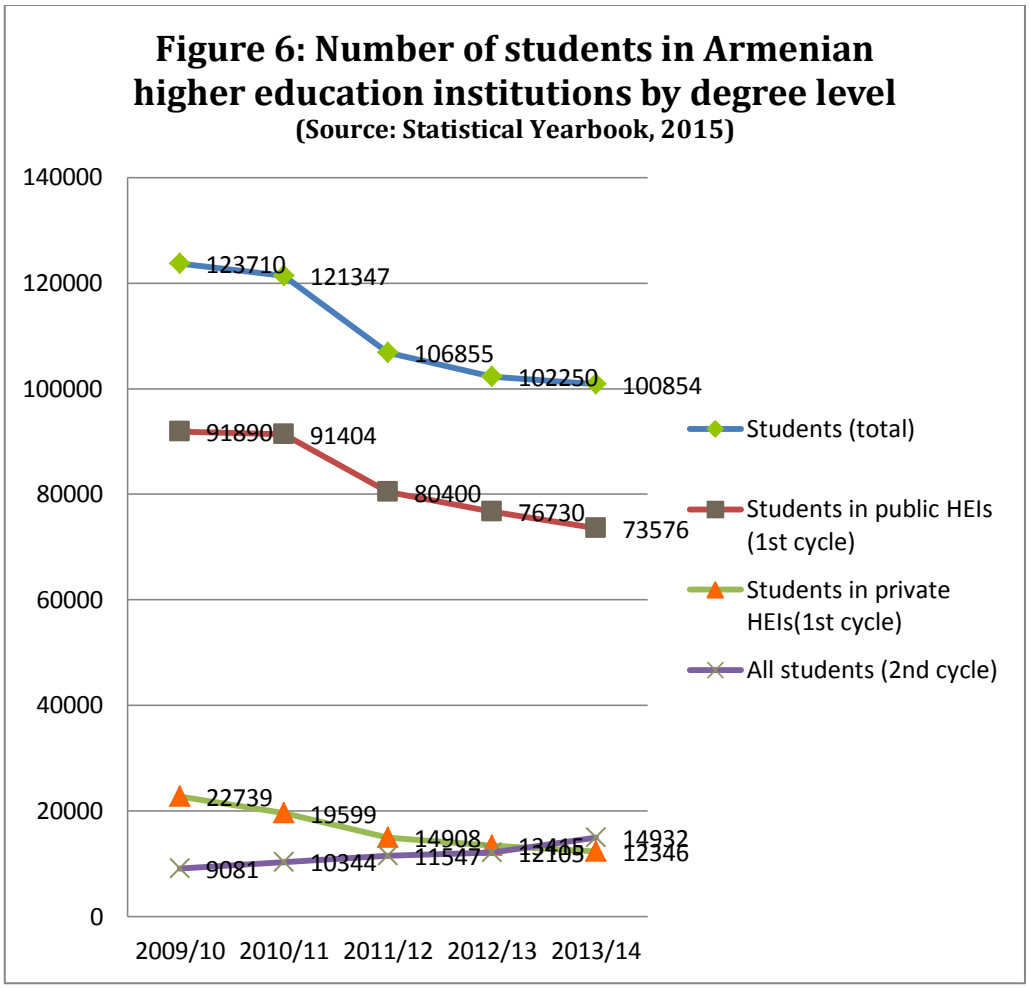
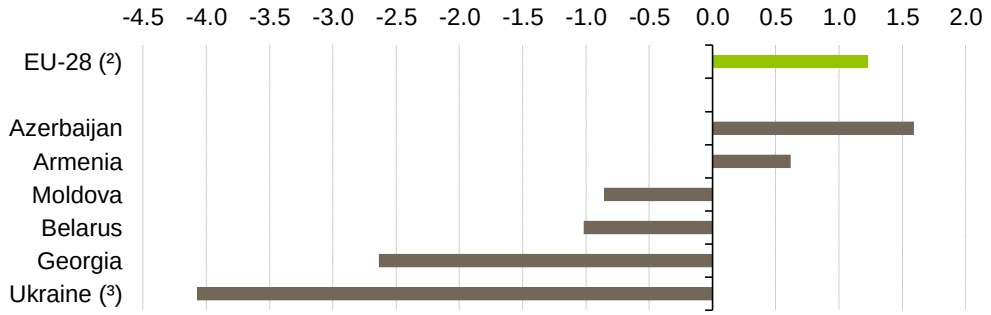
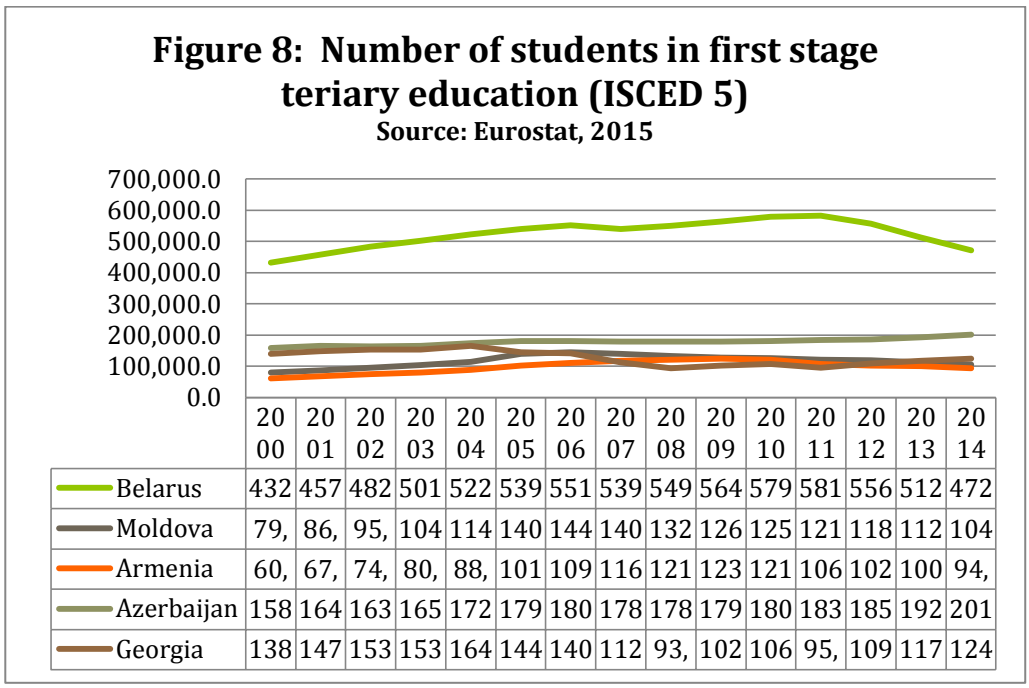


Figure 7 Average rate of change for the number of students in tertiary education, 2004-14 (1) (Eurostat, 2015) % per annum



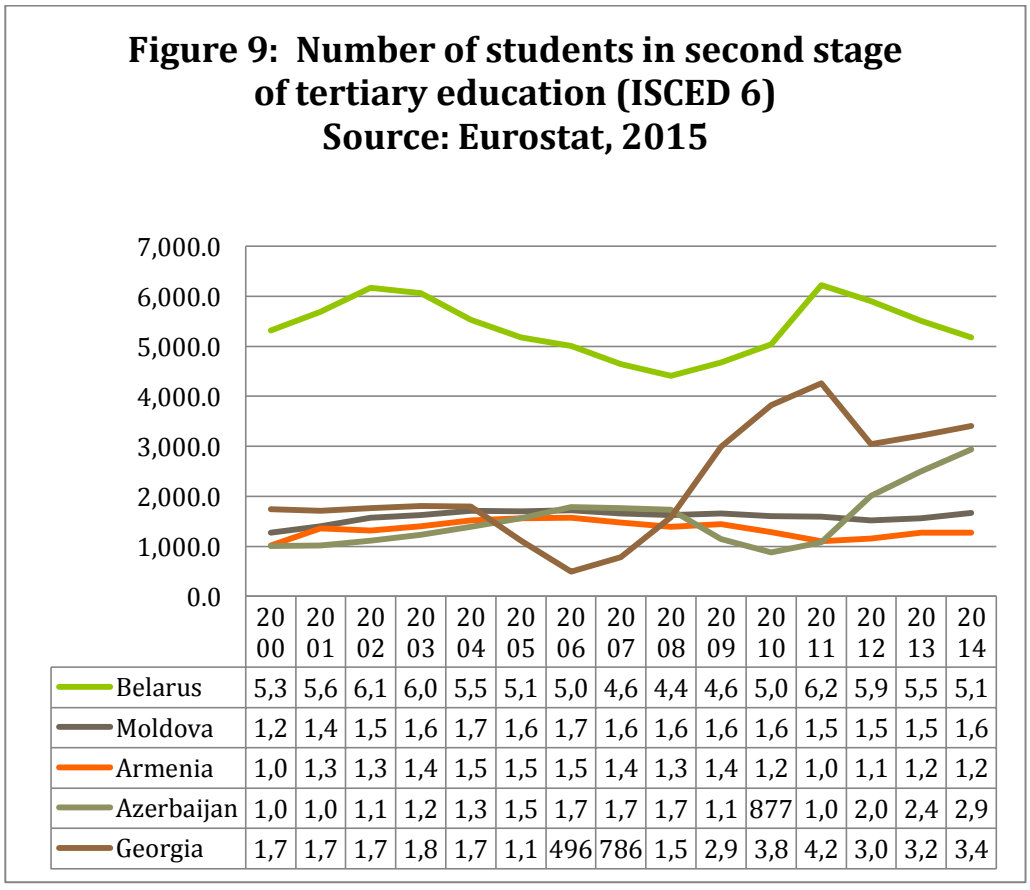
(1) Average rate of change in the total number of tertiary students (ISCED 1997 levels 5 and 6).

Figure 8 Number of students in first stage tertiary education (ISCED 5) (Eurostat, 2015)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Belarus	432	457	482	501	522	539	551	539	549	564	579	581	556	512	472
Moldova	79,	86,	95,	104	114	140	144	140	132	126	125	121	118	112	104
Armenia	60,	67,	74,	80,	88,	101	109	116	121	123	121	106	102	100	94,
Azerbaijan	158	164	163	165	172	179	180	178	178	179	180	183	185	192	201
Georgia	138	147	153	153	164	144	140	112	93,	102	106	95,	109	117	124

Figure 9 Number of students in second stage tertiary education (ISCED 6) (Eurostat, 2015)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Belarus	5,3	5,6	6,1	6,0	5,5	5,1	5,0	4,6	4,4	4,6	5,0	6,2	5,9	5,5	5,1
Moldova	1,2	1,4	1,5	1,6	1,7	1,6	1,7	1,6	1,6	1,6	1,6	1,5	1,5	1,5	1,6
Armenia	1,0	1,3	1,3	1,4	1,5	1,5	1,5	1,4	1,3	1,4	1,2	1,0	1,1	1,2	1,2
Azerbaijan	1,0	1,0	1,1	1,2	1,3	1,5	1,7	1,7	1,7	1,1	877	1,0	2,0	2,4	2,9
Georgia	1,7	1,7	1,7	1,8	1,7	1,1	496	786	1,5	2,9	3,8	4,2	3,0	3,2	3,4

Data on students by field of study (Figures 10 and 11) show a rather high concentration of enrolments in Arts and Humanities and Business, Administration and Law which jointly enrol more than half of the entire student body. Such distribution does not correspond well to the economy sectors which have been highlighted as priority development areas in the Armenia Development Strategy and are likely part of explanation for high unemployment rates also among graduates from tertiary education (see below). While the demand for tertiary education has been decreasing, the distribution of admissions between the fields of study has not much changed over the years. When it comes to first year admissions, all fields but ICT had faced a decrease since 2010/11 (albeit this field presents only a small share in total student body). The decrease in numbers was smaller in Natural sciences, mathematics and statistics than other fields. For example, in Arts and Humanities the numbers of first-year admissions have dropped from 9514 in 2010/11 to 5977 and in Business, economics and law from 5164 to 3732.

Accordingly with the decrease in number of enrolments also the number of completed bachelor's degrees decrees between 2010 and 2014 has also decreased considerably from 23935 in 2010/11 to 19702. Most significant decrease has been in number of graduates in the Arts and Humanities (from 9630 to 7966), but graduates in this field still represent 40% of all graduates. The number of graduates in Business, economics and law has actually increased from 3462 to 4088, which in 2014 represents 21% of all graduates. The number of graduates in ICT has increased slightly, but this field represents only a small share of all graduates (about 3%).

From the Statistical Yearbook it can be seen that a few fields have had no more enrolments in the past four years, such as aeronautical engineering, geodesy, manufacturing of forest resources. However, all in all the programmatic offer at Armenian higher education institutions paints a picture of high fragmentation of higher education offer with highly specialised bachelor's programmes and with a disproportionate distribution of enrolments in fields for which professions unemployment levels are high and which are not the optimal contributors to the economic development of the country.

Figure 10 Total number of students in 2010/11 by ISCED fields (Statistical Yearbook, 2015)

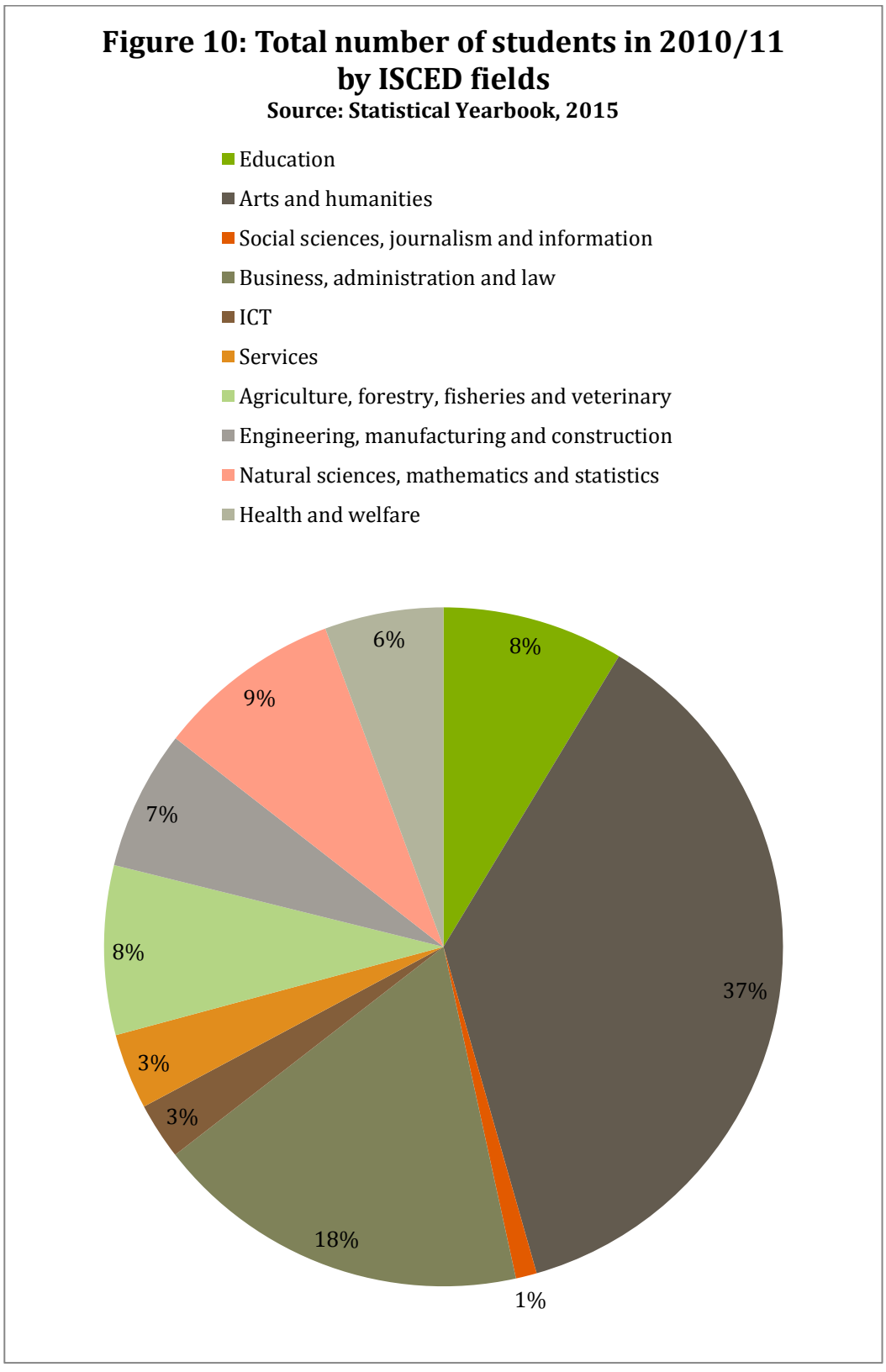
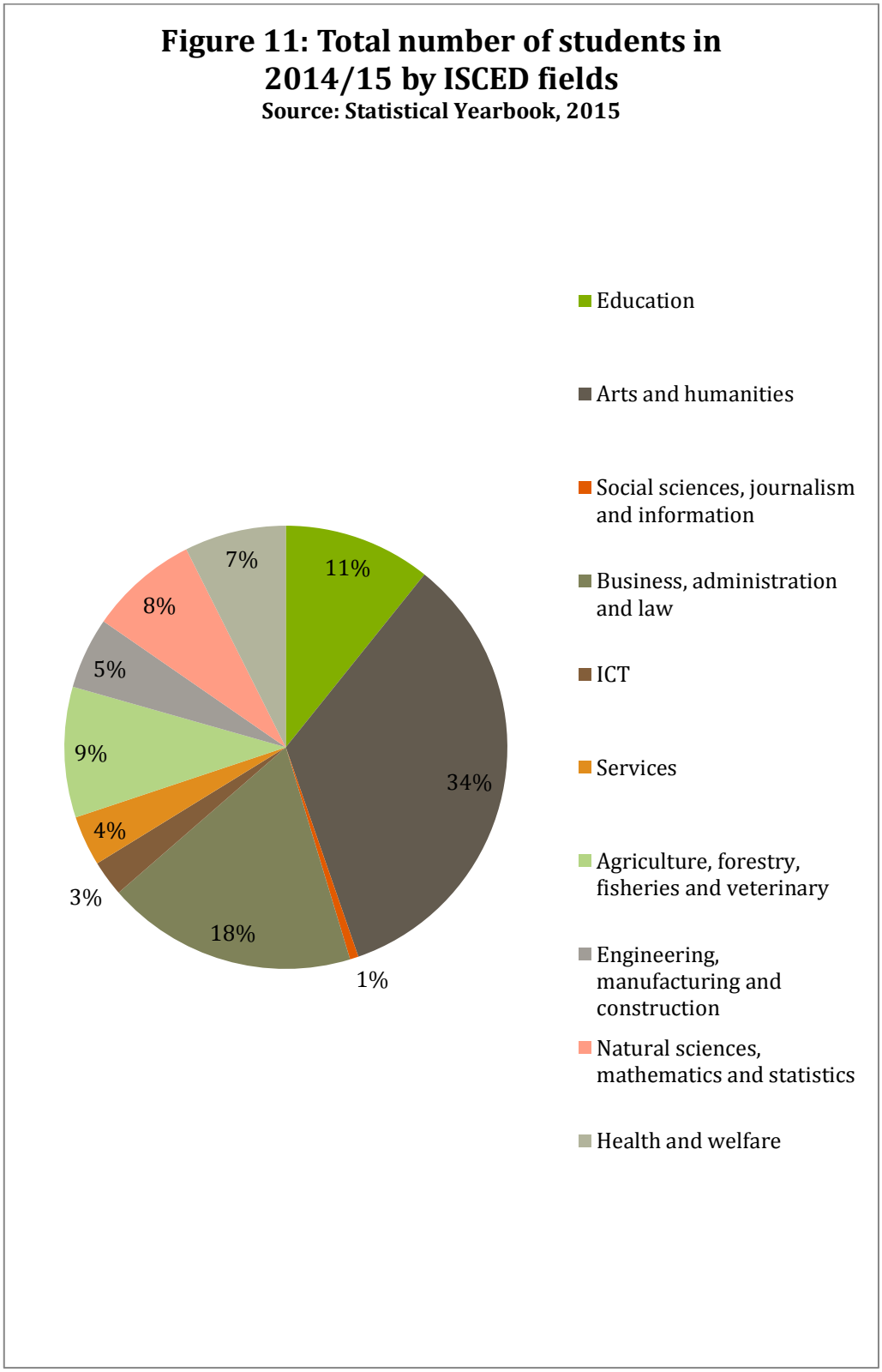


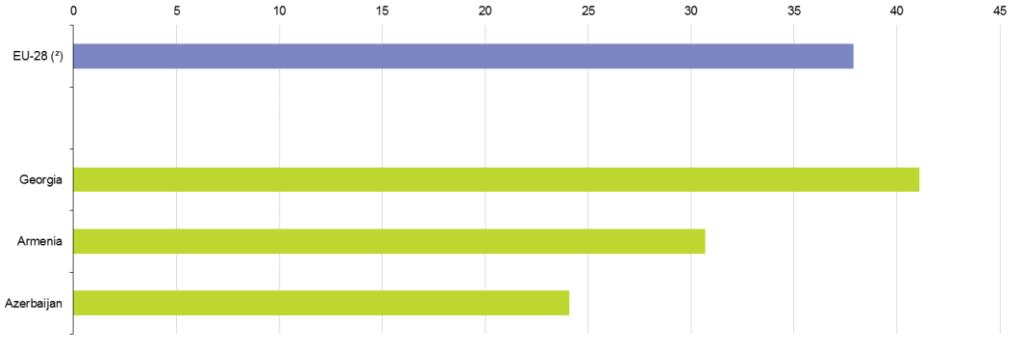
Figure 11 Total number of students in 2014/15 by ISCED fields (Statistical Yearbook, 2015)



3.D.3 Proportion of higher education graduates and employability of graduates

In 2014, Armenia's tertiary education attainment rate among population aged 30-34 years was 30.7%, which is lower than, for example, in the neighbouring Georgia (41.1%), but higher than Azerbaijan (24.1%), and lower compared to the EU average of 37.9%. In terms of highly educated workforce, Armenia has improved somewhat from 2011, when the attainment rate was 27.8%, whereas Georgia has decreased rate (from 44.1% in 2011 and in Azerbaijan the rate remain unchanged) (Eurostat, 2015). Nevertheless, Armenia does not show any significant growth in attainment rates and lies behind the targets in many European countries of at least 40% of the population aged 30-34 attained tertiary education with objective of developing high-participation higher education systems (Figure 12).

Figure 12 Proportion of 30–34 year olds having completed tertiary or equivalent education, 2014 (1) % in Eastern Partnership – East countries (Eurostat, online data codes: edat_lfse_07 and enpr_pseduc)



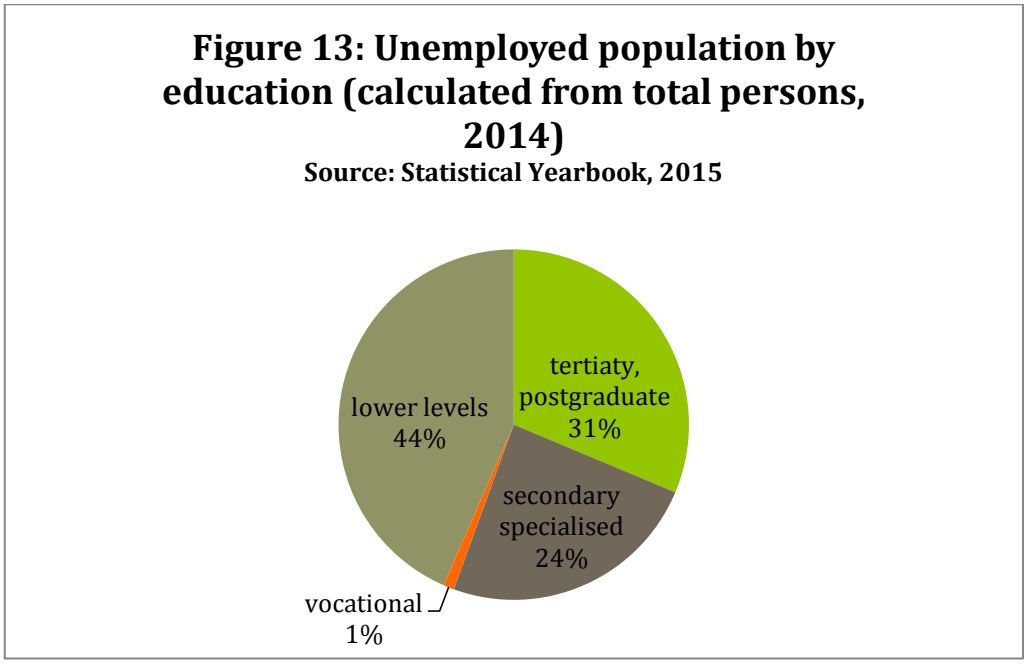
EU-28 (2) %	37.9
Georgia	41.1
Armenia	30.7
Azerbaijan	24.1

(1) ISCED 1997 levels 5 and 6. Belarus, Moldova and Ukraine: not available.
(2) ISCED 2011.
Source: Eurostat (online data codes: edat_lfse_07 and enpr_pseduc)

Tertiary education degree in Armenia makes it likelier to find employment, but not to the same extend as this is the case in some other European countries. In 2014, from all unemployed (242.1 in 1000 persons) 31% had tertiary, postgraduate education. Among all unemployed males, 28% were those with higher education whereas in case of female unemployment, 34% of all unemployed females had tertiary, postgraduate education. Unlike European countries where higher levels of education improve women's' employment prospects, this is less the case in Armenia. In Armenia, women

with tertiary degree are less likely than men with tertiary degree to find employment (European Commission/EACEA/Eurydice, 2015, 187). Furthermore, in the World Economic Forum's Human Capital Index (World Economic Forum and Mercer, 2015), Armenia is featured among top ten countries with the largest share of inactive tertiary-educated people (228,500 total number of tertiary-educated inactive people, which is 23.9% of all tertiary educated people and 8% of total population).

Figure 13 Unemployed population by education (calculated from total persons, 2014) (Statistical Yearbook, 2015)



To improve employability of graduates it is important to strengthen **the partnerships between universities and industry/businesses and non-profit organisations (such as cultural institutions)**. Several successful examples of university-business/industry collaboration already exist in IT area. The next steps should consider **how similar models of collaboration could be developed in other economy sectors, such as agriculture, tourism, etc.** and how they could be also expanded **to other regions** to stimulate regional development. Technoparks and industrial parks are also one of the possibilities for cross-sector partnerships. Furthermore, more attention needs to be paid to **collaboration between universities and small and medium sized enterprises**. Small and medium sized enterprises have comparatively weaker capacity for research and development than large industry firms, and are also less able to buy R&D. Perhaps this is one area where state funding for support of innovation could be channelled to help further develop SMEs. Apart from research and innovation, the partnership between universities and

industry/business and non-profit organisations should entail also collaboration in education by a way of involvement of societal stakeholders in management of organisations, curriculum planning, developing internships and career planning activities, etc.

Partnerships between universities and the private sector in terms of curriculum planning, arranging for internships and involvement of practitioners as visiting lecturers (or where appropriate as part-time lecturers) in education provision should be enhanced. Regular reviews of study programmes and curricular revisions are necessary in the fast changing market demands for skills. The initiatives, such as the World Bank-funded Competitive Innovation Fund aimed at modernising study programmes and make them more responsive to the needs of employers should be further extended.

Informing students about **entrepreneurship** as an alternative career path and entrepreneurship education should be integrated into the student career services at higher education institutions. To provide quality **entrepreneurship education**, it is important to understand that entrepreneurship education is more than simply business education as it deals with the questions of how to start a new business from scratch. There is also distinction to be made between different types of entrepreneurship, such as starting a local business or start-up business with potential to develop an innovative product or service for sale on international markets (i.e. the High-Potential Start-Up companies).

Interdisciplinary study programmes which combine several disciplines, such as for example technology and business or IT, engineering and business, lend themselves particularly suitable for integration of entrepreneurship education in the curriculum. However, entrepreneurship education should not be confined only to specific disciplines which naturally deal with the questions of entrepreneurship, but to students from all disciplines.

Entrepreneurship centres set up at universities to allow students to work in teams on real-world projects are another way to foster entrepreneurship education and these can be linked with the research and innovation centres, such as, for example, several that exist at the National polytechnic university of Armenia: the Cisco Networking Academy, The Armenian National Engineering Laboratories; the Mobile Applications Laboratory for Eastern Europe, South Caucasus, and Central Asia; and the Microsoft Innovation Center in Armenia.

Recommendations

R.4.2 Reform of study programmes and partnerships with private sector

- R.4.2.1 *Reviewing of programmatic offer* at both bachelor's and master's level in view of reduction in number of highly specialised programmes, exploring possibilities of combining several programmes.
- R.4.2.2 *Review programmatic offer, admission numbers, graduation numbers and compare with the labour market needs* (measuring graduate employability per study programmes). Such data should be communicated through public relations campaigns by the government (or related agencies) and specifically to secondary school students (and their families) and should also be communicated to career planning activities and services in secondary schools.
- R.4.2.3 *Revising study programmes to achieve societal relevance*, develop discipline-specific learning outcomes, advance knowledge base and follow student-centred approach in teaching, learning and assessment.
- R.4.2.4 Developing more *broad-based study programmes* (by merging several existing ones) and *interdisciplinary programmes* which avoid early specialisation and to avoid duplication of courses offered by different departments in related study programmes. Such reorganisation does not necessarily mean reduction in numbers of teaching staff as size of student cohort per programme would increase, but do imply collaboration between teaching staff in curricular planning, course preparation and course offerings.
- R.4.2.5 *Partnerships between universities and the private sector* in terms of curriculum planning, arranging for internships and involvement of practitioners as visiting lecturers (or where appropriate as part-time lecturers) in education provision should be enhanced.

3.D.4 Academic staff[45]

The ranks of academic staff in the public higher education sector include professors, docents, assistants and lecturers. Senior lecturer as a rank is no longer widely used. The private universities typically use three ranks: professor, docent and assistant or lecturer.

[45] The description of the context and conditions of academic work is reproduced from the chapter "The Academic Career in a Transition Economy: Case Study of the Republic Armenia" by Arevik Ohanyan in the book "Paying the professoriate: A global comparison of compensation and contracts edited by Philip Altbach et al. (Routledge, 2012). The depiction in the chapter was tested – and confirmed – in the interviews in December 2015 and supplemented with more recent data from the Statistical yearbook (2015).

Graduates with master's degree or diploma specialists (from previous system) are eligible to enter academic career as lecturer. Professionals who have completed postgraduate studies (*aspinatura*) and have passed qualifying examinations for candidate of sciences degrees are eligible for the position of assistant. To apply for the position of docent eligibility criteria include candidate of sciences degree with at least three years of scientific-pedagogical experience and at least three independent scientific publications after becoming a candidate of sciences. A doctor of sciences is eligible to apply for the position of professor with at least five years of scientific-pedagogical experience at the granting institution and significant number of research-based scientific publications (at least five scientific articles, a book, etc.). One of the conditions for an institution having a status of university is to employ at least 50% of all academic staff with a degree of the candidate of sciences.

There are four main types of academic contracts in use at public institutions:

1) Hourly based for small teaching tasks
2) Joint appointments when faculty member teaches and also has administrative duties or also teaches at another institution
3) Full-time non-competitive: contract is signed for up to one year
4) Full-time competitive: contract is signed for up to five years

There is no formal tenure system in public institutions although in case of full-time competitive contracts these are terminated only exceptionally. Five-year contracts tend to be prolonged almost automatically without rigorous assessment. Typically, internal candidates are preferred for new position openings even if these are advertised openly.

Teaching load for faculty is determined at the institution and ranges from 600 to maximum 1080 hours per year for full-time faculty. The time for research is typically not included in calculations of faculty and not remunerated; although some universities – such as the Yerevan State University - are trying to change this practice to strengthen their research profile and account for the different types of academic work: teaching and teaching-related services, research and other service. Definition of workload, promotion criteria/evaluation and remuneration should reflect these different academic activities. Conditions and infrastructure at many universities are not tailored to meet the needs of faculty research agendas, so research is often conducted outside home university. Faculty rely for research funding from national and international sources

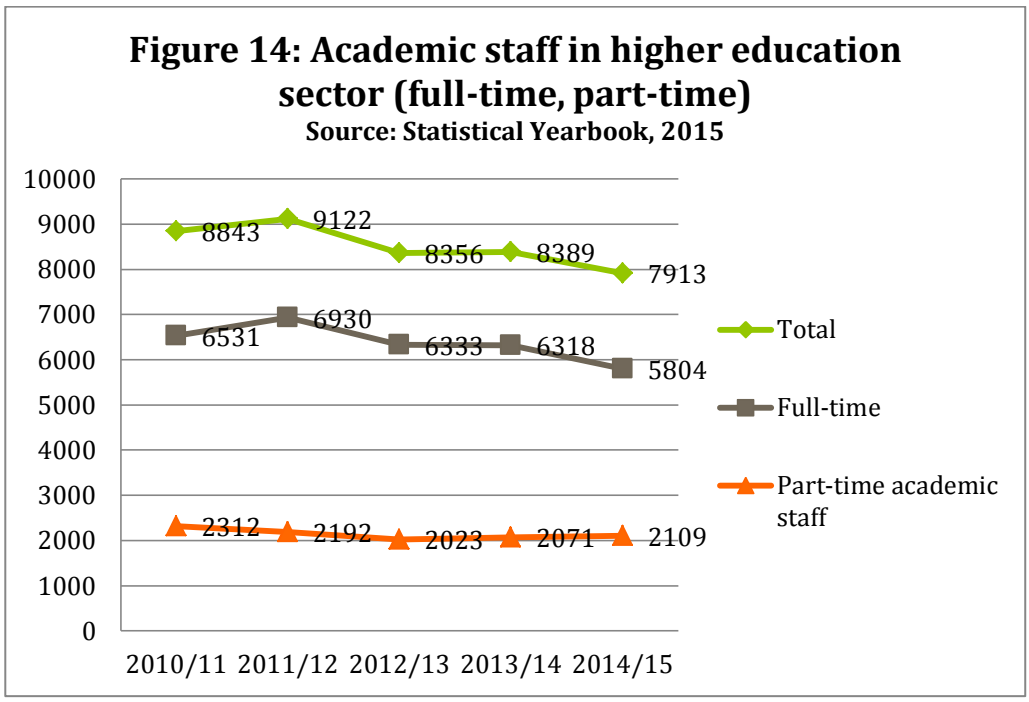
Factors affecting academic salaries include academic degree, rank and record of publications and research. For promotion, quality of teaching is the primary factor and student evaluations of teachers are becoming widely used instrument. There are high differences between the highest and lowest levels

of compensation and differentiation goes also across branches of public universities in different provinces and the profitability of the branch. In some cases, compensation in the regions was nearly 50% lower than in Yerevan. The differentiation is also based on fields of study and status and prestige of the institution. It is important to be reminded here that only 25-30% of the total budget of a public institution is funded by the state. In general there are little or no additional (nonsalary) benefits offered at the institutions (except vacation pay and coverage for maternity leave). The government is developing a special program to subsidize apartments in buildings for junior faculty and subsidize home mortgage loans (all junior academic staff in public universities are eligible to apply). Common trend in Armenia is that faculty members are being employed at more than one institution: they teach at a public university (which gives them certain professional standing and status) and have additional positions at several private universities. Another option is to also work as researcher in one of the research institutes, engage in professional consulting or are entrepreneurs. In sum, the compensation of entry- or mid-level economists and computer scientists in the private sector possessing master's degrees is similar to that of the highest-ranking professors in those fields in academia. Starting salaries and benefits for young faculty are below levels associated with middle class income in Armenia. Young academics in particular seek to supplement and diversify their incomes by concurrently teaching at more than one institution or engaging in other activities, such as private tutoring, sponsored research, consulting.

In general, the conditions of academic work and remuneration in Armenia are not competitive enough to attract international faculty. In fact, low compensation for academic work has over the years resulted in brain drain. Low faculty salaries relative to the cost of living correlates with faculty having to find other forms of income – often teaching at another institution.

In 2014/15 there were 7913 teaching in total (*regular*) employed at higher education institutions in Armenia. Overall, the number of teaching staff has been gradually decreasing over the past five years (in 2010/11, there were 8843 staff employed in total). The rate of decrease in number of full-time staff is modestly bigger (10.5%) than for part-time-staff (8.7%) (Figure 14).

Figure 14 Academic staff in higher education sector (full-time, part-time) (Statistical Yearbook, 2015)



Note: Includes persons at the beginning of the academic year.

Both, distribution of academic staff according to academic degree and according to academic status (rank) have kept fairly steady over the past five years (Figures 15 and 16). Data in the Statistical Yearbook is not organised into most meaningful categories in terms of number of academic staff according to academic degree or status. It would be more helpful to break-down data on academic staff according to academic degree to the categories mentioned earlier, namely academic staff with:

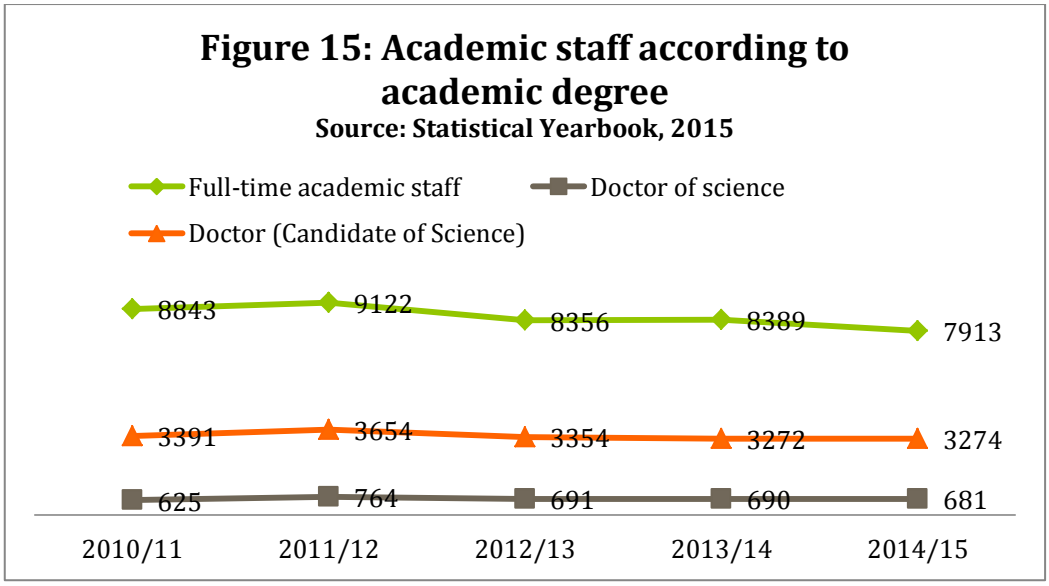
- master's degree or diploma
- completed postgraduate studies (*aspinatura*)
- candidate of sciences degree
- doctor of sciences.

Armenia obviously practices the two-tier system of doctoral degrees, whereby the degree of Candidate of Sciences is the level of the first doctoral degree and Doctor of Sciences is the second-level. The data for 2014/15 reveals that about a half of all academic staff in the system has candidate of sciences or doctor of sciences degree, both of which are fall into the third cycle (Level 7). This rate fares well with a rule of thumb recommendation for flagship universities **to have at least 40% of the permanent staff with doctoral degrees** (Douglass,

2016); however we do not have data on distribution of academic staff according to academic degrees for higher education institutions, where this 40% rule is critical. Given the state guidelines that for status of university at least 50% of staff needs to have third-cycle degree, it can be assumed that this condition is implemented system-wide if it is duly checked by the ministry as part of the standard reporting requirements for universities.

Furthermore, it would be relevant to have the **break-down of academic staff according to gender and academic degrees** to analyse how gender-balanced is distribution of academic degrees (and enrolments into third-cycle programmes and whether there are gender-related bottlenecks).

Figure 15 Academic staff according to academic degree (Statistical Yearbook, 2015)



Note: Includes persons at the beginning of the academic year.

Similarly, for comparability the data on academic status (rank) of academic staff should be organised according to the categories as discussed above:

- professors,
- docents,
- assistants
- lecturers.

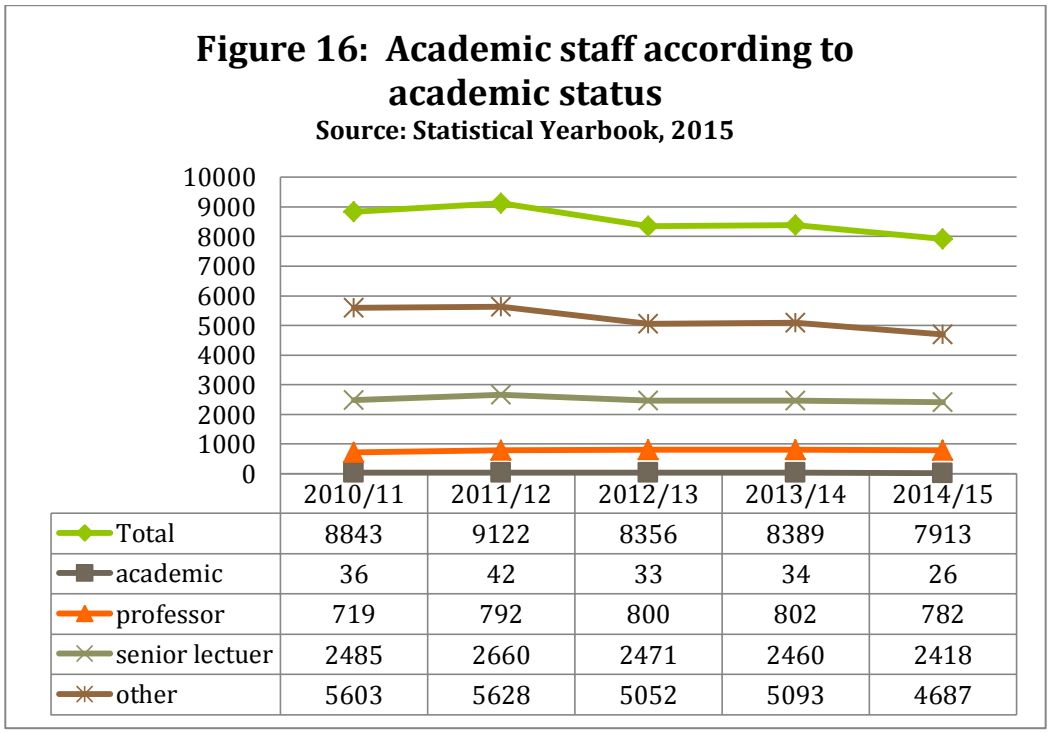
In 2014/15, 10% of all staff held professorship or academician status, which is clearly senior rank. Again, a rule of thumb recommendation for flagship universities is to have at **least 25% of the permanent faculty (defined as full-**

time) in the senior ranks (defined as a full or associate rank or equivalent) (Douglass, 2016). From the system data it is not possible to discern to what extent this recommendation applies on institutional level. This is something that needs to be addressed in quality assurance procedures and in standard reporting (and possible performance agreements) between the government and the higher education institutions.

Further issue that need to be addressed is the **ratio of female to male senior faculty**, and to explore whether there might be barrier (formal or informal) for women to rise to senior faculty ranks. One of the key questions regarding promotion of women in academia concerns the rules and practices on maternity leave coverage, both financially, but also whether maternity leave absences are considered in promotion and the criteria are adjusted (for example by prolonging the required number of years for work experience or number of publications in line with maternity leave).

Age distribution of teaching staff is another area that needs further attention and could not be assessed by this study due to lack of data: Is staff aging? Are there enough of young academic staff joining the higher education institutions?

Figure 16 Academic staff according to academic status (Statistical Yearbook, 2015)



	2010/11	2011/12	2012/13	2013/14	2014/15
Total	8843	9122	8356	8389	7913
academic	36	42	33	34	26
professor	719	792	800	802	782
senior lectuer	2485	2660	2471	2460	2418
other	5603	5628	5052	5093	4687

Note 1: Includes persons at the beginning of the academic year.

Note 2: This data is not structured meaningfully based on the main categories of academic ranks as discussed above, i.e. professors, docents, assistants and lecturers. Senior lecturer as a rank is no longer widely used.

The teacher-student ratio at higher education institutions in 2014/15 has been 1:12 (79623 students enrolled in first cycle and 14476 enrolled in second cycle = 94099 all students / 7913 all academic staff = 11.89 students per 1 staff). From the data is it impossible to find out whether this number includes all staff employed at higher education institutions, including administrators, maintenance staff, etc. or only teaching staff. The flagship university model recommends that academic staff-to-student ratios – counting undergraduate and graduate Student Full-Time Equivalents (meaning student with full course-load) and counting Teaching Faculty Full-Time Equivalents should not exceed 25 to 1, and a target at top universities tends to be around 16 to 1 (Douglass, 2016). This question needs to be clarified in the system-level data as well as in institutional evaluations through quality assurance evaluations and regular reporting requirements by the government.

Recommendations

R.4.3 Organisation of academic work, remuneration and professional development of academic staff

- R.4.3.1 Organisation of work for academic staff should reflect the teaching, research and service functions as defined through the institution's mission and profile. In particular, *research function*, as well as knowledge transfer and other third mission activities, *need to be duly accounted for in work load, promotion criteria and remuneration* of academic staff at research universities (or any institution where research-based publications are part of promotion requirements).
- R.4.3.2 *Monitoring the distribution of academic staff* according to academic degrees and academic status along with gender and age distribution. A rule of thumb recommendation is at least 40% of the permanent staff should have doctoral degrees, and at least 25% of the permanent faculty (defined as full-time) should be in the senior ranks (defined as a full or associate rank or equivalent). There should be representative gender balance at all levels of academic staff, including supervisory and management level. This should be achieved on the basis of an equal opportunity policy at recruitment and at the subsequent career stages without, however, taking precedence over quality and competence criteria. Appropriate measures (through QA and performance agreements) should be developed to resolve imbalances.
- R.4.3.3 Academic staff is paramount resource of any higher education system. Therefore, careful *monitoring of the structure and dynamic in academic staff at system level, and conditions of academic work and remuneration on institutional level* is crucial. Consideration could be given to initiating national research projects into academic profession (such as, for example,

research conducted within global research network on Conditions of Academic Work – CAP).

- R.4.3.4 There are pronounced *disparities in remuneration* of academic staff in Armenia. While higher education institutions have a full autonomy on academic staff matters, some *broad guidelines about terms and conditions of academic appointments, remuneration and contracts of academic staff* should be agreed among the higher education institutions, trade unions representing academic staff and the Ministry. Such guidelines should tackle questions, such as inequalities in salaries between academic ranks (senior professors versus junior academic staff); allocation of salary based on length of service or performance measures (research productivity, teaching quality, knowledge transfer) added; simultaneous teaching at multiple institutions, etc. This is to ensure that academic staff in Armenia can enjoy a middle-class lifestyle without having to simultaneously work multiple jobs, which is detrimental to quality of teaching and to research (and third mission activities). The health of academic profession is critical for the future of higher education system.
- R.4.3.5 Continuation and strengthening of *social programmes to support young academic staff (and young researchers)*; such as the one set by the government to help young academic staff access subsidies housing and subsidies home loans (and ensuring that these provisions are distributed in fair and transparent manner). In particular young academic staff and researchers often do not earn enough for a modest middle-class standard of living, which is a rule of thumb criteria for adequate remuneration (see Altbach et al. 2012).[46]
- R.4.3.6 *Revision of the organisation of workload, career paths and remuneration* of the academic staff affected by institutional mergers or formal cooperation among higher education institutions, among research institutes and between higher education institutions and research institutes.
- R.4.3.7 Initiating and supporting *system-wide professional development activities* for academic staff to improve quality of teaching, learning and assessment (e.g. training programmes, workshops, exchange of best practices, public acknowledgement of innovation in teaching) and possibly introduction of certificates for teaching in higher education (for all new teaching staff and recertification for all teaching staff in regular intervals.
- R.4.3.8 *Employment contracts* for academic staff should be developed in a way to ensure that the performance of academic staff is not undermined by instability of employment contracts.

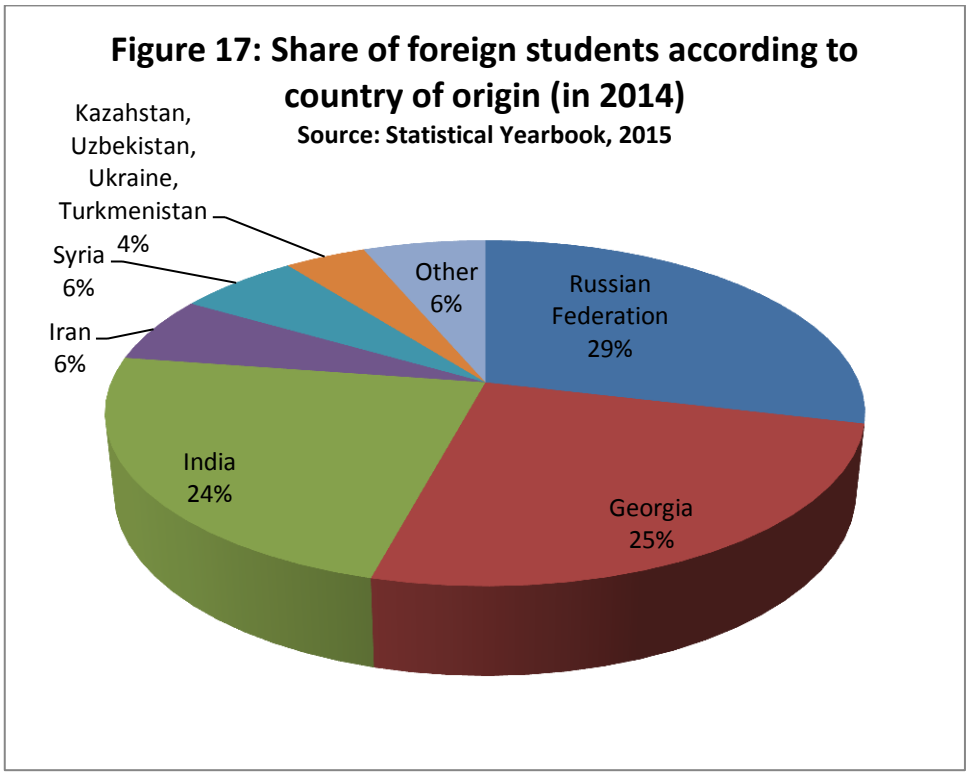
[46] Altbach, P.G., L. Reisberg, M. Yudkevich, G. Androushchak, and I. F. Pacheco (2012) *Paying the Professoriate: A Global Comparison of Compensation and Contracts*. New York: Routledge.

- R.4.3.9 Ensure that academic staff and researchers are provided with working conditions which allows both men and women to balance family and work; in particular, attention should be given to flexible working hours, part-time working, tele-working and sabbatical leaves. For academic staff who have taken childcare leave, such absences should be taken into account in decisions on promotion (i.e. the clock stops for the period of childcare absence).
- R.4.3.10 Introducing system for evaluation/appraisal of professional performance of all academic staff (including senior professors), on a regular basis and in a transparent manner by an independent committee.

3.D.5 Foreign students and student mobility

The number of foreign students in Armenia has increased modestly between 2010 and 2014: from 3316 to 3647 students in total in first cycle (in 2015 foreign students presented 4.6% of the entire student body in the first cycle), and from 214 to 282 foreign students in the second cycle whereby foreign students represent 1.9% of the entire student body. Most foreign students come from the Russian Federation (29%), Georgia (25%) and India (24%). Indian students in particular demand education in medical sciences (Figure 17).

Figure 17 Share of foreign students according to country of origin in 2014 (Statistical Yearbook, 2015)



Recommendations

R.4.4 Internationalisation of education provision

- R.4.4.1 Introducing *internationalisation strategy* as part of the new Higher Education Strategy.
- R.4.4.2 Initiating and supporting institutions in *developing specific institutional profile* concerning their educational offer; i.e. select specific study programmes to be offered in foreign languages to attract foreign students.
- R.4.4.3 Fostering *foreign language teaching, teaching in foreign languages* and possibilities for students to prepare their theses and dissertations in a foreign language.
- R.4.4.4 Fostering *internationalisation of curricula*; curricular reform to account for global knowledge.
- R.4.4.5 Using *ICT in internationalisation of education provision* (e.g. use of MOOCs aside of local teaching).
- R.4.4.6 Supporting *expansion of student and staff short-term mobility*.
- R.4.4.7 Enabling and supporting *joint courses and joint and double degree programmes* with other institutions at home and abroad.

Missing data:
1) Employment rates by educational attainment and gender
2) Differences in earning between female and male workers by educational attainment
3) Mean monthly earnings by educational attainment
4) Completion rates/drop-out rates
5) Duration of study
6) Staff and student short-term mobility

E. Research

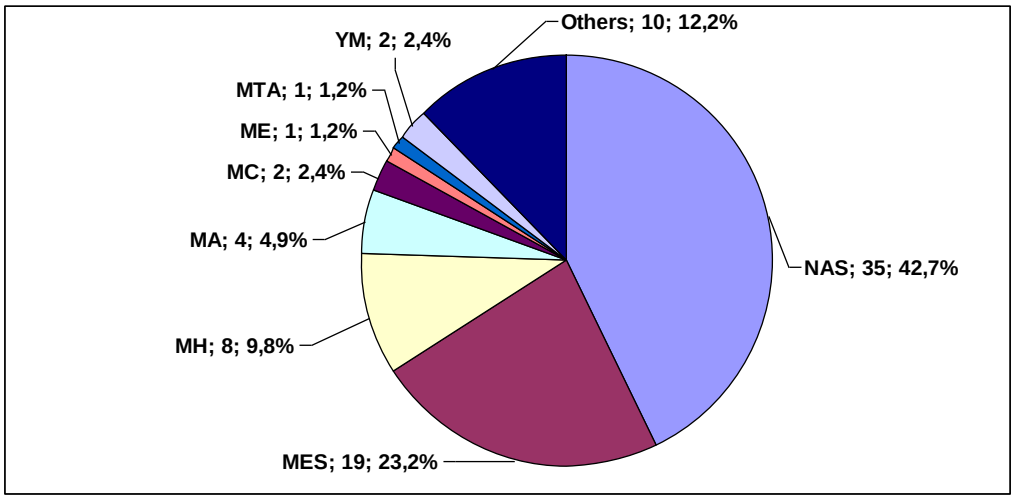
3.E.1 Research sector in Armenia

In Armenia, research activities are fairly fragmented in a large number of scientific establishments. In 2012, there were in total 82 research establishments (research institutes, universities and research institutes affiliated to research centres or foundations) involved in state-funded research programmes and projects (Table 12 and Figure 19, Sakahyan, 2014). The research institutes under the National Academy of Sciences present 43% percent of all research organisations.

Table 12 Number of Research Institutes, Universities and Research Institutes Affiliated to Research Centres or Foundations in 2012 (Sakahyan, 2014)

Ministry/ NAS/ Yer.Mun.	Number of Research Institutes, Universities and Research Institutes Affiliated to Research Centres or Foundations: 2012
National Academy of Science	35
Ministry of Education and Science	19
Ministry of Healthcare	8
Ministry of Ariculture	4
Ministry of Culture	2
Ministry of Economy	1
Ministry of Territorial Administration	1
Yerevan Municipality	2
Others	10
Total	82

Figure 18 Number of Research Organizations at Ministries and National Academy of Science (Sakahyan, 2014)[47]

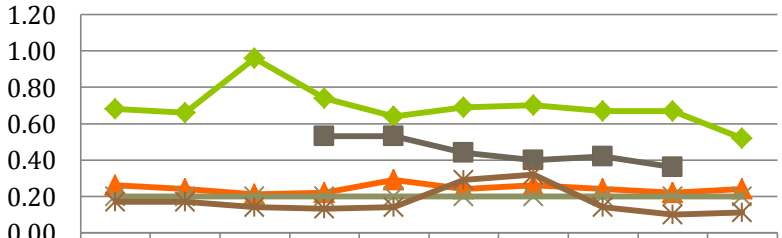


Gross domestic expenditure for research and development in Armenia is fairly low, especially in comparison to the region, averaging 0.25% of GDP over past ten years, with little annual variation observed in recent years (Figure 19). Although the statistical record of R&D expenditure is incomplete in Armenia, as R&D expenditure in the privately-owned business enterprises is not surveyed, the share of such expenditure is also estimated to be low.

Figure 19 Gross domestic expenditure on R&D, relative to GDP (%) (Eurostat, 2015)

Figure 19: Gross domestic expenditure on research and development, relative to GDP (%)

Source: Eurostat, 2015 (Note: For Armenia Eurostat estimate)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Belarus	0.68	0.66	0.96	0.74	0.64	0.69	0.70	0.67	0.67	0.52
Moldova				0.53	0.53	0.44	0.40	0.42	0.36	
Armenia	0.26	0.24	0.21	0.22	0.29	0.24	0.26	0.24	0.22	0.24
Azerbaijan	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Georgia	0.17	0.17	0.14	0.13	0.14	0.29	0.32	0.14	0.10	0.11

[47] Sahakyan, V. (2014) Reforms in Research and Development Sector in Armenia. Policy Workshop Innovation Performance Review of Armenia, Yerevan, 14 November 2014.

Public funding allocations are distributed almost evenly between the National Academy of Sciences and its constituent research institutes and the universities which fall under the auspices of the Ministry of Education and Science (Table 13 and Figure 20, Sakahyan, 2014). Only minor share goes to other research institutes that fall under the competences of other ministries.

Table 13 R&D Sector: Budget Allocations – 2011 per institution in total amounts (Sahakyan, 2011)[48]

R&D Sector: Budget Allocations-20

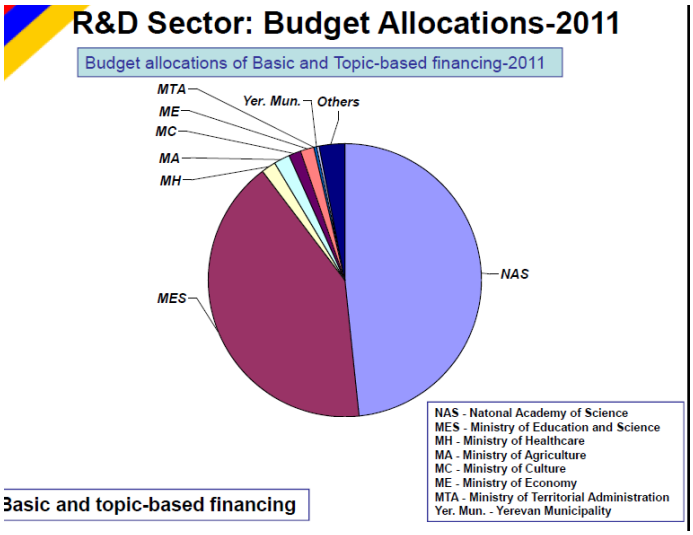
R&D Expenditure

	R&D Expenditure in 1000 AMD	R&D Expenditure as % of GDP
2010	8355609.2	0.24
2011	9433092.7	0.25

Budget allocations of Basic and Topic-based financing-2011

Ministry/NAS/Yer.Mun.	Financing in 1000 AMD	%
National Academy of Science	3766617,0	48,26
Minimstry of Education and Science	3236207,0	41,47
Ministry of Healthcare	128168,4	1,64
Ministry of Agriculture	153260,0	1,97
Ministry of Culture	118082,0	1,51
Ministry of Economy	125433,0	1,61
Ministry of Teritorial Administration	23560,0	0,30
Yerevan Municipality	23760,0	0,30
Others	229459,0	2,94
Total	7804547,0	

Figure 20 R&D Sector: Budget Allocations – 2011 per institution % (Sahakyan, 2011)

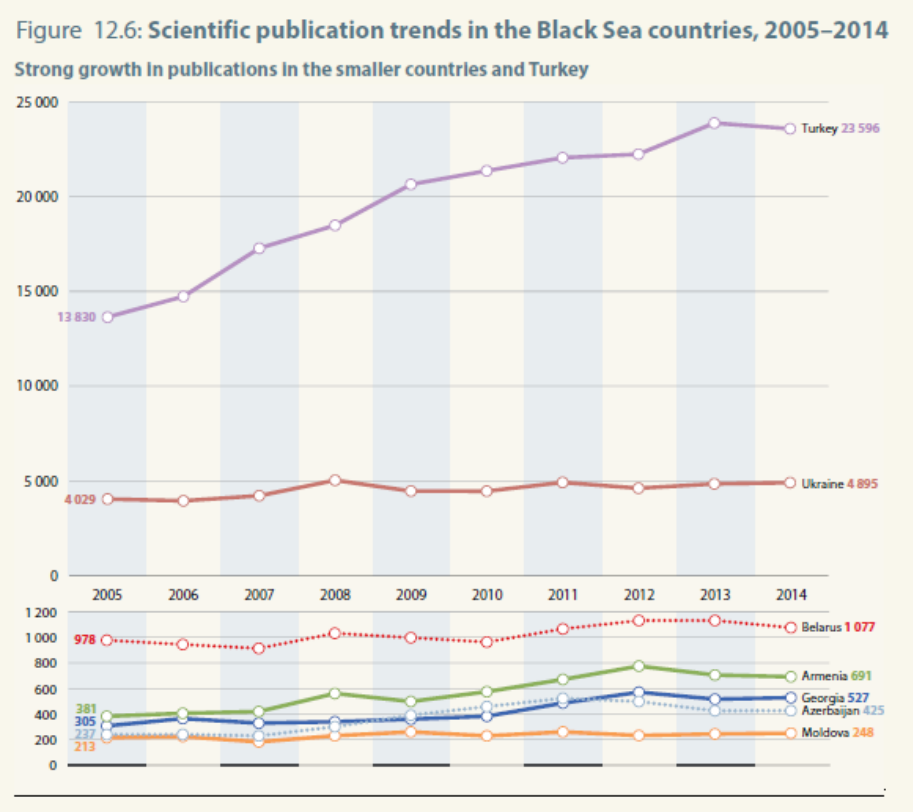


[48] Sahakyan, V. (2011) Reforms in Research and Development Sector in Armenia. Presentation in Tbilisi, November 1-3, 2011.

3.E.1 Research output

In terms of research output, i.e. publications, publication density and citations Armenia is doing reasonably well on the system-level. The number of publications is rather constant (Figure 21), and majority of publications are in the fields of physics and astronomy, engineering, material science, mathematics and chemistry (Figure 23). Yet, in the region Armenia is second to Turkey in publication intensity (number of publications per 1000 inhabitants) (Figure 22). The fields of physics and astronomy, engineering, material science, mathematics and chemistry are also those in which Armenian publications receive most citations (ADS, 2014, page 117). In the region, Armenia comes second to Georgia in average citation rate (Figure 22). Georgian and Armenian scientists score best in the region in terms of reaching 10% of most cited papers (Figure 24). Armenia has also a fairly high number of co-authored papers with foreign collaborators (Figure 24; UNESCO, 2015a, 322).[49]

Figure 21 Scientific publications trends in the Black Sea countries (2005-2014) (UNESCOa, 2015, 322)



[49] UNESCO (2015a) UNESCO Science Report: towards 2030. UNESCO Publishing, 2015

Figure 22 Citation rate in the Black Sea countries (UNESCOa, 2015, 322)

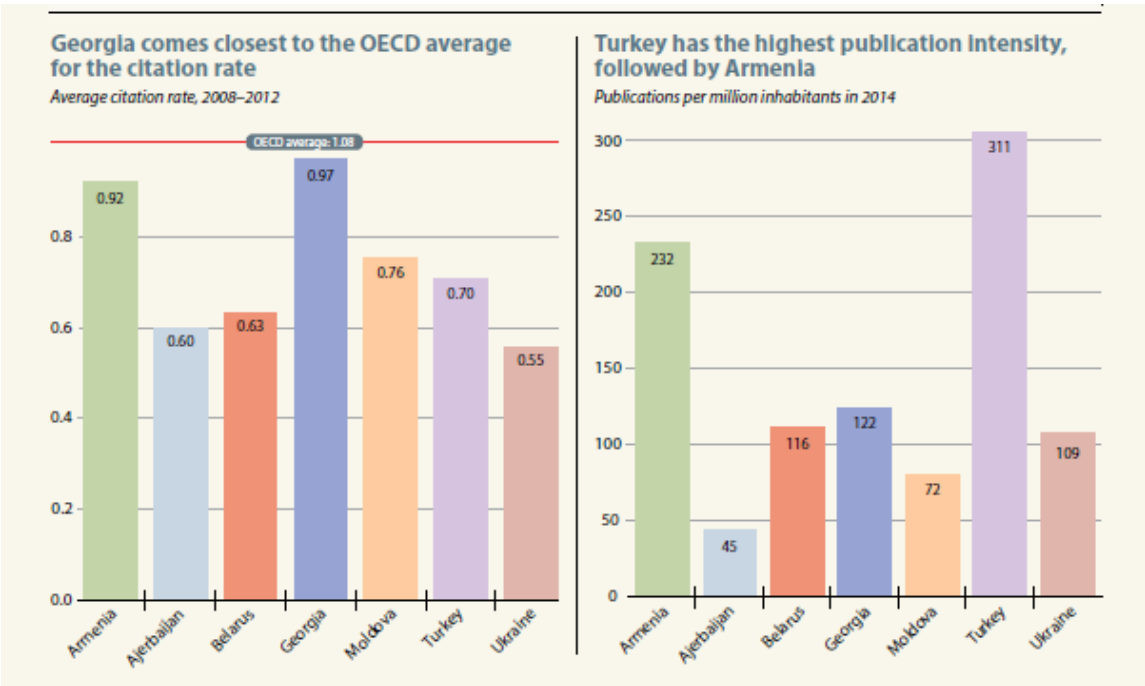


Figure 23 Share of publications per discipline in the Black Sea countries (UNESCOa, 2015, 323)

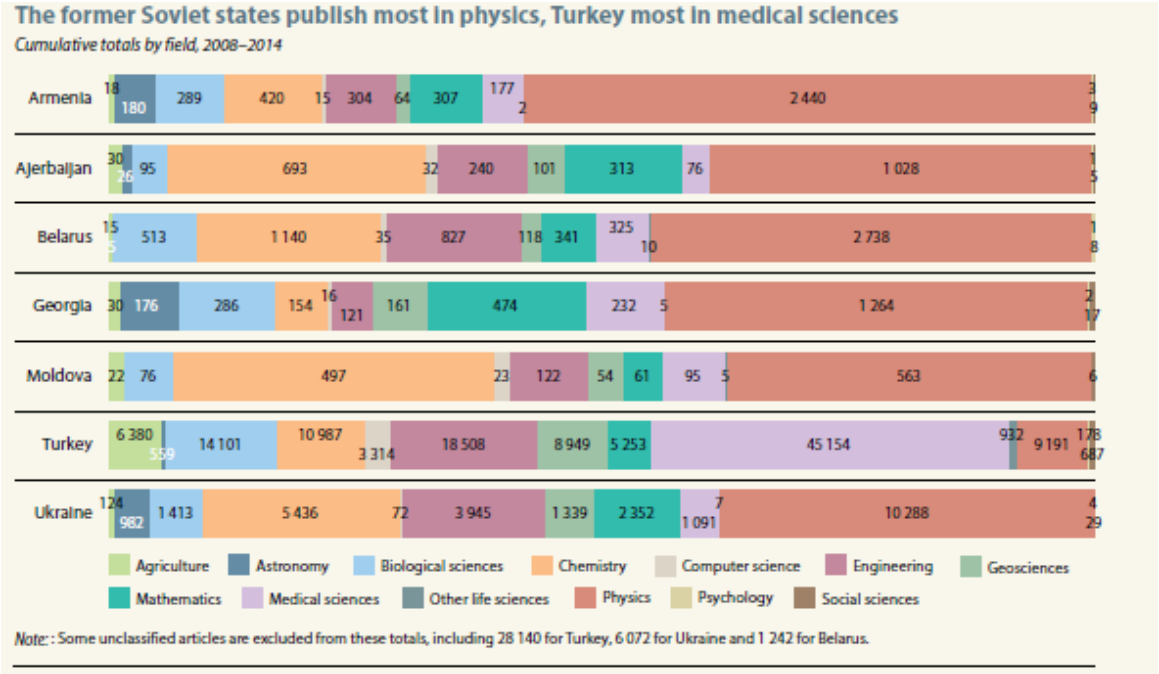
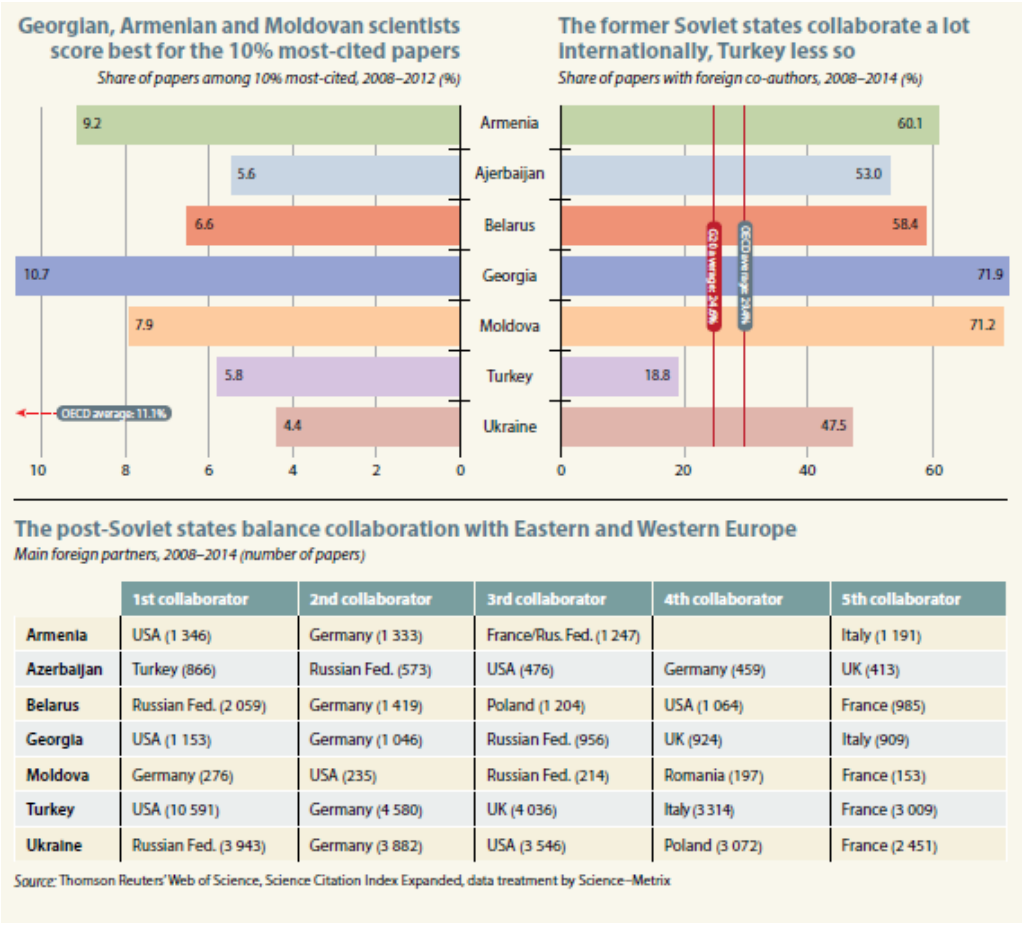


Figure 24 Share of papers among 10% most cited and number of papers with foreign co-authors in the Black Sea countries (UNESCOa, 2015, 323)



The post-Soviet states balance collaboration with Eastern and Western Europe

Main foreign partners, 2008–2014 (number of papers)

	1st collaborator	2nd collaborator	3rd collaborator	4th collaborator	5th collaborator
Armenia	USA (1 346)	Germany (1 333)	France/Rus. Fed. (1 247)		Italy (1 191)
Azerbaijan	Turkey (866)	Russian Fed. (573)	USA (476)	Germany (459)	UK (413)
Belarus	Russian Fed. (2 059)	Germany (1 419)	Poland (1 204)	USA (1 064)	France (985)
Georgia	USA (1 153)	Germany (1 046)	Russian Fed. (956)	UK (924)	Italy (909)
Moldova	Germany (276)	USA (235)	Russian Fed. (214)	Romania (197)	France (153)
Turkey	USA (10 591)	Germany (4 580)	UK (4 036)	Italy (3 314)	France (3 009)
Ukraine	Russian Fed. (3 943)	Germany (3 882)	USA (3 546)	Poland (3 072)	France (2 451)

Source: Thomson Reuters' Web of Science, Science Citation Index Expanded, data treatment by Science-Metrix

3.E.2 Research staff

Number of researchers per million inhabitants has been decreasing in Armenia (Figure 25; UNESCO, 2015a).

Figure 25 Researchers per million inhabitants (UNESCOa, 2015, 317)

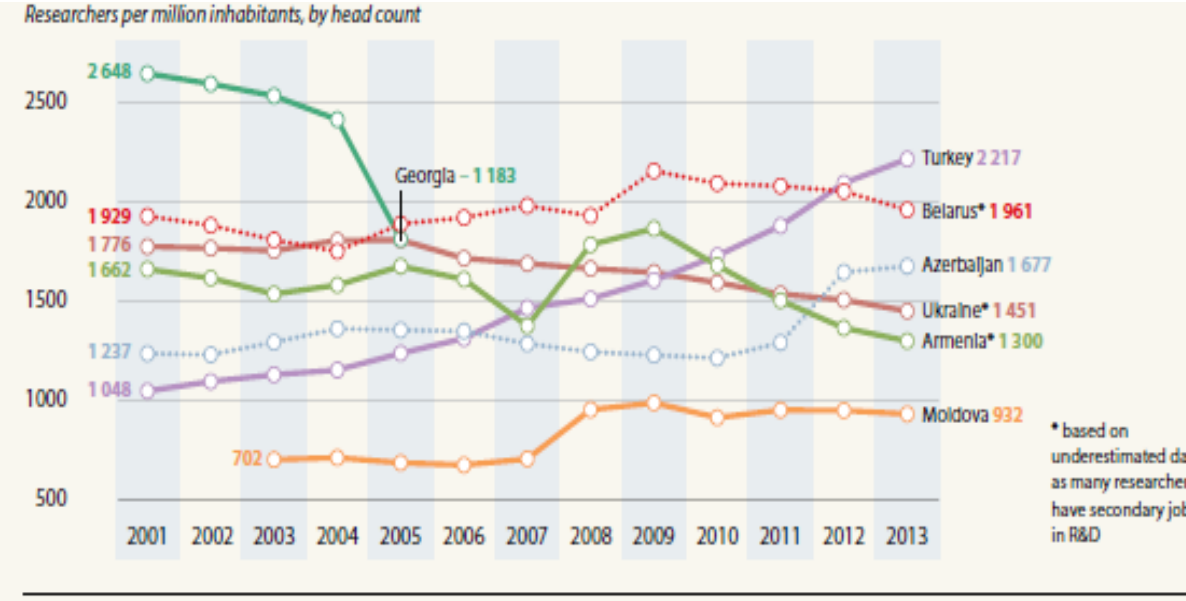


Table 14 Researchers in Black Sea countries by field of employment and gender, 2013 (UNESCO, 2015a, 317)

Researchers in Black Sea countries by field of employment and gender, 2013

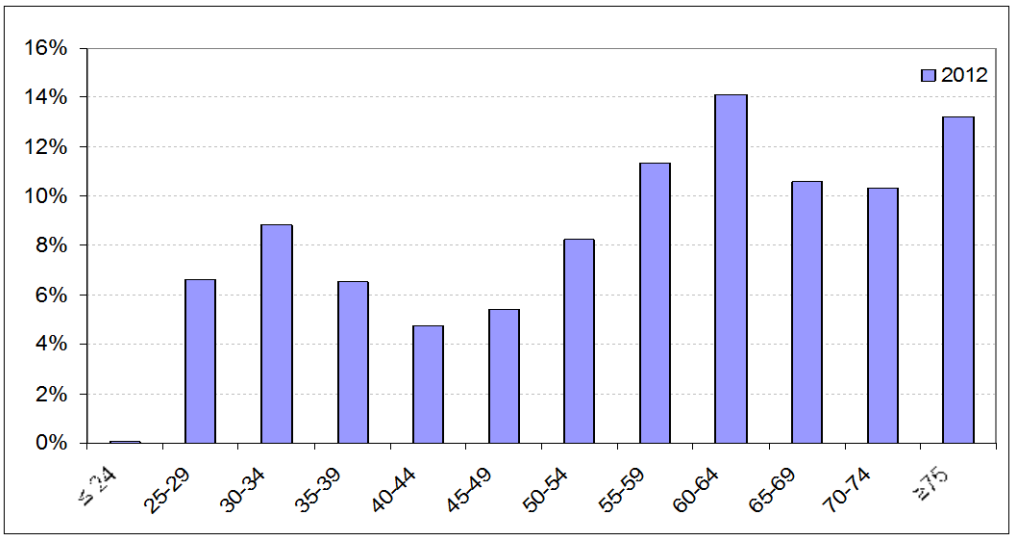
By head counts

	Total		Natural sciences		Engineering		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	Total	Women (%)	Total	Women (%)	Total	Women (%)	Total	Women (%)	Total	Women (%)	Total	Women (%)	Total	Women (%)
Armenia*	3 870	48.1	2 194	46.4	546	33.5	384	61.7	45	66.7	217	47.0	484	60.5
Azerbaijan	15 784	53.3	5 174	53.9	2 540	46.5	1 754	58.3	1 049	38.5	2 108	48.9	3 159	63.1
Belarus	18 353	41.1	3 411	50.6	11 195	31.5	876	64.6	1 057	60.1	1 380	59.1	434	60.8
Moldova	3 250	48.0	1 168	45.7	448	29.0	457	52.5	401	45.4	411	68.4	365	52.6
Turkey	166 097	36.2	14 823	35.9	47 878	24.8	31 092	46.3	6 888	31.6	24 421	41.1	12 350	41.9
Ukraine	65 641	45.8	16 512	44.5	27 571	37.2	4 200	65.0	5 289	55.0	4 644	61.4	2 078	67.8

Note: Data for Turkey are for 2011. *Partial data

According to age distribution, researchers holding scientific degrees and involved in state programmes and projects are aging (Sahakyan, 2014).

Figure 26 Share of researchers employed in research organisations, 2012 by age (Sahakyan, 2014).



Along with decrease in enrolments in other cycles, also enrolments in the third cycle have been decreasing (Sahakyan, 2014).

Table 15 Number of doctoral candidates enrolled in doctoral programmes per discipline (Sahakyan, 2014)

	2007	2008	2009	2010	2011
NATURAL SCIENCES	235	225	309	294	223
ENGINEERING AND TECHNOLOGY	240	205	220	190	198
MEDICAL SCIENCES	63	55	46	41	32
AGRICULTURAL SCIENCES	59	48	26	22	16
SOCIAL SCIENCES	574	559	577	486	438
ARMENOLOGY & HUMANITIES	243	228	215	199	147
TOTAL	1414	1320	1393	1232	1054

Recommendations

R.5.1 Organisation of research at universities

- R.5.1.1 *Strengthening research function at universities* across disciplines and departments, ensuring that education function at universities is accompanied with research and that research supports teaching. To

achieve this various measures of restructuring of higher education institutions could be considered, such as merging departments, mergers of university units with research institutes (of similar scientific direction) or other formal cooperation of research institutes and universities (for example, creating joint research labs or centres). The goal is to achieve concentration of research resources and facilities at universities, and creating possibilities for interdisciplinary research.

- R.5.1.2 Strengthen *post-graduate education at universities* and *post-doctoral courses*; when appropriate joint doctoral programmes between higher education institution and research institute or through institutional mergers. Again, formal links between universities and research institutes can help to achieve this goal. At the same time *post-graduate students can assist with teaching and supervision* (as teaching fellows) of undergraduate students.
- R.5.1.3 Organisation of a *technological research university* (as, for, example Massachusetts Institute of Technology) by merging the existing technological universities or by creating a formal network/consortium of technological universities.
- R.5.1.4 *Increasing funding* for research, and support to universities for diversifying funding sources to support their research activity.
- R.5.1.5 Strengthening programmes for funding *institutional research excellence* (centres of excellence) along *with individual scientists' research excellence*.
- R.5.1.6 Strengthening funding programmes for *young researchers*; i.e. competitive research funding for postdoctoral researchers, where they can apply without senior researchers.
- R.5.1.7 Ensuring stable growth of researchers in scientific and technical fields.

R.5.2 Research environment at universities

- R.5.2.1 *Upgrading material and infrastructure base* of research activities at universities.
- R.5.2.2 Enhancing *effectiveness of research* in universities.
- R.5.2.3 Identifying *specific research priorities*, institutional research profiles, centres of research excellence.
- R.5.2.4 Aiming towards *integration of education and research*.

R.5.3 Researchers' work, status and remuneration

- R.5.3.1 Developing *a charter for researchers and code for researchers* (possibly following the European Charter for Researchers),[50] which the roles, responsibilities and entitlements of researchers as well as of employers and/or funders of researchers.
- R.5.3.2 Having clearly developed and fully implemented *ethical principles in conducting research*.
- R.5.3.3 Enabling *mobility of researchers* as a means of professional development.
- R.5.3.4 Developing *a clear career path for researchers* within universities: full-time researchers and those that combine research function with teaching.
- R.5.3.5 Ensuring that researchers (and academic staff) are provided with working conditions which allows both men and women researchers *to balance family and work*; in particular, attention should be given to flexible working hours, part-time working, tele-working and sabbatical leaves. For researchers who have taken childcare leave, such absences should be taken into account in promotion and in applications for research funding (i.e. the clock stops for the period of childcare absence).
- R.5.3.6 Introducing system for *evaluation/appraisal of professional performance* of all researchers (including senior researchers), on a regular basis and in a transparent manner by an independent committee. Such system should be linked to promotion policies and remuneration.

R.5.4 Doctoral studies

- R.5.4.1 Further developing doctoral programmes (the organised set of selected taught courses and research opportunities within one or more disciplines); taking into consideration that the primary goal of doctoral education is research training through individual research experience (and should not be viewed as another study level although there is taught course component in such programmes); allowing for interdisciplinarity, transferable skills and mobility (EUA 2010).[51]
- R.5.4.2 Ensuring that supervisors of doctoral candidates have sufficient time, expertise and commitment to work with doctoral candidates. Appropriate remuneration for supervision work should be considered to ensure sufficient involvement. At the same time, a clear code of conduct

[50] http://ec.europa.eu/euraxess/index.cfm/rights/europeanCharter

[51] European University Association (EUA) (2010) Salzburg II recommendations: European Universities' Achievements since 2005 in Implementing the Salzburg Principles. http://www.eua.be/Libraries/publications-homepage-list/Salzburg_II_Recommendations.pdf?sfvrsn=0

needs to be established which protects doctoral candidates from too large teaching workload (on behalf of their supervisors or otherwise) and that teaching duties are adequately remunerated.

- R.5.4.3 Ensuring that doctoral candidates also develop transferable skills and have career developing opportunities for networking within research sector and in non-academic sectors.
- R.5.4.4 Creating possibilities for mobility of doctoral candidates through EU programmes or bilateral cooperation.
- R.5.4.4 Increasing stipends for doctoral students for maintenance and ensuring that doctoral candidates enjoy adequate social security coverage.
- R.5.4.5 Considering development of doctoral schools.
- R.5.4.6 Creating supportive conditions for employment of PhD holders outside academia (e.g. through tax incentives to private enterprises).

R.5.5 Internationalisation of research activity at universities

- R.5.5.1 Considerably expanding international cooperation in the field of research at universities (and beyond).
- R.5.5.2 Enabling and supporting research mobility.

F. Third mission: knowledge transfer, innovation, entrepreneurship and outreach

The concept of the Triple Helix of university-industry-government relationships initiated in the 1990s by Etzkowitz (1993)[52] and Etzkowitz and Leydesdorff (1998)[53] interprets the shift from a dominating industry-government dyad in the industrial society to a growing triadic relationship between university-industry-government in the knowledge Society. The Triple Helix thesis is that the potential for innovation and economic development in a knowledge society lies in a more prominent role for the university and in the hybridisation of elements from university, industry and government to generate new institutional and social formats for the production, transfer and application of knowledge. The same principle applies in cooperation between government, non-profit sector (i.e. cultural and social institutions) and universities. Innovation has expanded from an internal process within and even among firms to an activity that involves institutions not traditionally thought of as having a direct role in innovation such as universities. The academic 'third mission' - involvement in socio-economic development, next to the traditional missions of teaching and research, is becoming a salient area of research universities.

The Armenia Development Strategy reaffirms the objective to strengthen the partnerships between universities and industry/businesses [and non-profit organisations (such as cultural institutions) – added by the author] by the way of universities performing research services, transfer knowledge through sale or patents and intellectual property rights and universities developing their own business enterprises. It is important to stress that universities do not and should not only partner with business entities, but also with cultural and other civils society organisations, such as cultural institutions in other to contribute to social and cultural development on pair with economic development.

Several successful examples of university-business/industry collaboration already exist in IT area. The next steps should consider how similar models of collaboration could be developed in other economy sectors, such as agriculture, tourism, etc. and how they could be also expanded to other regions to stimulate regional development. Technoparks and industrial parks are also one of the possibilities for cross-sector partnerships. Furthermore, more attention needs to be paid to collaboration between universities and small and medium sized enterprises. Small and medium sized enterprises have comparatively weaker capacity for research and development than large

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[52] Etzkowitz, H. (1993) Technology transfer: The second academic revolution. Technology Access Report 6, 7-9.

[53] Etzkowitz, H., Leydesdorff, L (1998) The endless transition: A "triple helix" of university industry-government relations. *Minerva* 36, 203-208.

industry firms, and are also less able to buy R&D. Perhaps this is one area where state funding for support of innovation could be channelled to help further develop SMEs. Apart from research and innovation, the partnership between universities and industry/business and non-profit organisations should entail also collaboration in education by a way of involvement of societal stakeholders in management of organisations, curriculum planning, developing internships and career planning activities, etc.

The key principles of higher education's role in innovation include the recognition of:

1) Mutual dependency of higher education, research, innovation and entrepreneurship in knowledge-based economies

2) Innovation, defined as processes by which organisations adopt new product designs or manufacturing or operations processes, is key to national competitiveness.

3) Higher education institutions play two-fold role in innovation: training the workforce involved in innovation activities and contributing to innovation through own R&D activities.

Table 16 Possible activities in university-industry cooperation (Douglass 2016)

1) Direct funding of research costs through contracts and grants.
2) Formal licensing to industry of University-owned patents and technology.
3) Gifts and endowments including endowed chairs designated for colleges, schools, departments, or individuals.
4) University-industry exchange programs and student internships.
5) Specialized programs designed by the University for continuing education and training of professionals, primarily through University Extension.
6) Participation of industry representatives on campus and University wide advisory groups.
7) Cooperative research projects, some of which include government participation and the use of specialized facilities.
8) Use of unique University facilities on a fee-for-service basis.
9) Research and development facilities of industries housed on University property industrial parks.
10) Faculty consulting.

Higher education institutions should also develop collaboration with primary and secondary schools in order to contribute to widening participation, popularise science and contribute to education processes in secondary schools.

Recommendations

R.6.1 Partnership between universities and industry, business and non-profit organisations

- R.6.1.1 *Strengthening the partnerships* between universities and relevant research institutes with industry/businesses and non-profit organisations (such as cultural institutions) by a combination of activities that may include:
    - direct funding of research costs through contracts and grants;
    - formal licensing to industry of university-owned patents and technology;
    - university-industry exchange programs and student internships;
    - specialized programs designed by the university for continuing education and training of professionals;
    - participation of industry representatives in university governance and advisory groups;
    - cooperative research projects;
    - use of unique university facilities on a fee-for-service basis;
    - research and development facilities of industries housed on university property industrial parks;
    - academic staff and researchers' consulting activities and expert services.
- R.6.1.2 Universities should not only partner with business entities, but also with cultural and other civils society organisations, such as cultural institutions in other to contribute to social and cultural development on pair with economic development.

R.6.2 Strengthening knowledge transfer and commercialisation of research

- R.6.2.1 Strengthening conditions and mechanisms for knowledge and technology transfer between public research and the surrounding society (also in view of regional development), such as departmental support structures, consultancy services, seed funding opportunities and entrepreneurship education and networking opportunities.

- R.6.2.2 Fostering commercialisation of research results from public research institutions should be improved.
- R.6.2.3 Developing innovation-support infrastructure
- R.6.2.4 Revising regulations to stimulate and support the creation of spin-off companies at universities.
- R.6.2.5 Addressing intellectual property ownership issues, especially intellectual property created as a result of government financing.
- R.6.2.6 Ensuring that researchers at all career stages reap the benefits of the exploitation (if any) of their R&D results through legal protection and, in particular, through appropriate protection of Intellectual Property Rights, including copyrights.

R.6.3 Entrepreneurship education

- R.6.3.1 Informing students about entrepreneurship as an alternative career path and *entrepreneurship education should be integrated into the student career services* at higher education institutions.
- R.6.3.2 *Interdisciplinary study programmes* lend themselves particularly suitable for including entrepreneurship education in the curriculum. However, entrepreneurship education should not be confined only to specific disciplines which naturally address the questions of entrepreneurship, but to students from all disciplines.
- R.6.3.3 Setting up *entrepreneurship centres* at universities to allow students to work in teams on real-world projects; linked to research and innovation centres.

R.6.4 Outreach to primary and secondary schools and general public

- R.6.4.1 Fostering outreach activities for primary and secondary schools and for general public.
- R.6.4.2 Supporting events and initiatives that popularize science by a way of "Science week", "Art Week", "Entrepreneurship Week", when higher education institutions hold open days and targeted events (e.g. workshops) for pupils and general public.
- R.6.4.3 Supporting events (such as lecture series) which are open to the public.

4. Conclusions

Table 17 Strengths and weaknesses of Armenian higher education system

Country	Strengths	Weaknesses
Armenia	• Higher education is valued in Armenian society – higher education helps to get a better job and salary • There has been a broad commitment to allocation of resources and structural changes of the university system • A stable funding model has been established and there have been large investments in public and private research and development over time • Strong academic leadership with focus on academic excellence in establishing creative environments • Fairly good research output measured by number of scientific publications (and impact in terms of citations) compared to other countries in the region • Share of graduates from secondary level education will improve due to newly introduced free secondary education – more candidates for the third level education • Some excellent examples of higher education-research-industry collaboration and applied and practice oriented training and research programmes • Diaspora is willing to engage in higher education and science.	• Lack of commitment to structural changes to higher education and research systems • Highly fragmented higher education system in terms of number and purpose of higher education institutions • The funding arrangements do not support profiling and strategic orientation/positioning of higher education institutions, optimal size of institutions or system diversification. • The higher education system is not well funded; most likely resulting in lower quality of education, poor research at universities, limited research infrastructure at universities (and research institutes?) • Disproportionately high private investment into higher education • Tuition fees are high compared to average salary • Poor regional coverage in terms of higher education institutions and research institutes • Unclear how satisfied employers are with graduate skills • Low percentage of students in third-level • Funding dispersed between a fairly large number of higher education institutions and research institutes • Differences between types of higher education institutions (including research institutes which also have educational provision) unclear • Are study programmes within higher education institutions clearly demarcated as academic vs professional? • Is there clear division between private and public sector in terms of purposes and missions? • Increased policy focus on science-industry linkages, however the role of higher education under-emphasised • Talent drain and difficulties attracting foreign talent

The following step for the Government should be to devise an inclusive, interactive process of strategy formation. A possible approach could be to form several "communities of practice", i.e. groups of professionals from all relevant stakeholders (e.g. different departments from the ministry, the Academy of Sciences, higher education institutions, the Higher Education Reform Experts, representatives from industry and business, student associations, etc.) to work on a particular aspect of strategy. Such cross-functional communities would not only draft the actual wording for specific areas of the strategy, and thus develop ownership of the strategy, but also ensure that the strategy objectives are shared with their own organisations (and feedback is received) and that informal networks of professionals working on higher education reforms in the country are created or strengthened ensuring future collaboration. It should be remembered that the process of strategy formation matters as much as what the strategy expresses in writing.

Recent reforms have led to many improvements in higher education sector in Armenia. In the last decade, the Bologna reforms have been a major step forward as did the more recent revisions of the student support schemes. Despite modest investment in research, the research output, especially in comparison to the region, fares fairly well. The changes in the legal status of universities – many of the adopting the status of foundations – is also a major improvement.

However, without any major increase in public funding, the pressures for further rationalisation continue. Both higher education and (the overlapping) research systems are highly fragmented with large number of institutions. System restructuring towards mergers and other types of formal arrangements between different higher education institutions (including research institutes) should be fully considered. Restructuring of higher education system should be developed along with system diversification (higher education institutions developing distinct missions and profiles and strategic positioning in selected market niches) to better respond to labour market and industry's needs (including regional needs) and to boost international competitiveness.

Armenia is a country which traditionally places high value on education in skills. It is part of the national character to encourage learning and parents go out of their way to enable their children to study. These traditional national values that emphasize education and skills are an important aspect of Armenian culture and a crucial ingredient in further development of higher education. Although Armenia has been deprived of much of its talent migrating to the developed countries, the large Armenian diaspora tends to retain close ties to the country. These connections should be further developed into various forms of involvement of diaspora in higher education and science.

Bibliography

Altbach, P.G., L. Reisberg, M. Yudkevich, G. Androushchak, and I. F. Pacheco (2012) *Paying the Professoriate: A Global Comparison of Compensation and Contracts*. New York: Routledge.

Athena Project (2015) The Athena Project on 'Fostering Sustainable and Autonomous Higher Education Systems in the Eastern Neighbouring Area', which involves Armenia, Moldova and the Ukraine, (A Tempus IV Project); http://www.athena-tempus.eu

Baley, T. (2014) The role and functions of higher education councils and commissions in Africa. A case study of the Kenya Commission for Higher Education. Wymberg, South Africa: The Centre for Higher Education Transformation (CHET); http://chet.org.za/files/Kenya%20ROLE%20AND%20FUNCTIONS%20OF%20HE%20COMMISSIONS%20AND%20COUNCILS.pdf

Benneworth, Paul, Harry de Boer & Ben Jongbloed (2015) Between good intentions and urgent stakeholder pressures: institutionalizing the universities' third mission in the Swedish context, *European Journal of Higher Education*, 5:3, 280-296.

Capello, R., A. Olechnicka and G. Gorzelak (2012) *Universities, Cities and Regions Loci for Knowledge and Innovation Creation*. Routledge.

CHEPS (2008) Formulating the Financing Principles and Exploring Alternative Financial Mechanisms for Armenian Tertiary Education, World Bank, 2008

Douglass, J. (ed.) (2016) *A New Flagship University: Changing the Paradigm from Global Rankings to National Relevancy*. Palgrave Macmillan.

EHEA (2015) Yerevan Ministerial Communique. EHEA Secretariat, 2015.

The European Charter for Researchers: http://ec.europa.eu/euraxess/index.cfm/rights/europeanCharter

European Commission/EACEA/Eurydice (2015) *The European Higher Education Area in 2015: Bologna Process Implementation Report*. Luxembourg: Publications Office of the European Union.

European Commission (2015) Joint staff working document: Implementation of the European Neighbourhood Policy in Armenia. Progress in 2014 and recommendations for actions. Brussels, 25.3.2015, SWD(2015) 63 final.

European Commission (2012) TEMPUS Country Fiche "Higher Education in Armenia", Education, Audiovisual and Culture Executive Agency (EACEA), July 2012.

EUA - European University Association (2015) Define thematic report: university mergers in Europe by E. Bennetot Pruvot, T. Estermann and P. Mason. Brussels: European University Association; http://www.eua.be/Libraries/define/2define-thematic-report-2-university-mergers-in-europe_final.pdf?sfvrsn=0

EUA - European University Association (2014) DEFINE thematic report: funding for excellence by Bennetot Pruvot and T. Estermann. Brussels: European University Association; http://www.eua.be/Libraries/define/1define_funding-for-excellence.pdf?sfvrsn=7

EUA - European University Association (2014) DEFINE thematic report: Performance-based funding of universities in Europe by A.-L. Claeys-Kulik and T. Estermann. Brussels: European University Association; http://www.eua.be/Libraries/define/3define-thematic-report_-pbf_final-version.pdf?sfvrsn=0

EUA - European University Association (2010) Salzburg II recommendations: European Universities' Achievements since 2005 in Implementing the Salzburg Principles; http://www.eua.be/Libraries/publications-homepage-list/Salzburg_II_Recommendations.pdf?sfvrsn=0

European Union – Regional Policy (2011) Connecting Universities to Regional Growth, A Practical Guide. http://ec.europa.eu/regional_policy/sources/docgener/presenta/universities2011/universities2011_en.pdf

Eurydice (2008) Higher Education Governance in Europe: Policies, structures, funding and academic staff. Brussels: Eurydice.

EV Consulting (2012) Public support to higher education in prioritized areas of economy, EV Case study, Yerevan, 2012.

Etzkowitz, H. (1993) Technology transfer: The second academic revolution. Technology Access Report 6, 7-9.

Etzkowitz, H., Leydesdorff, L. (1998) The endless transition: A "triple helix" of university industry-government relations. *Minerva* 36, 203-208.

The Government of Republic of Armenia – Councils: http://www.gov.am/en/councils/

i-graduate: Student Barometer: http://www.i-graduate.org/services/student-barometer/

Klemenčič, M. (2016) Reflections on a New Flagship University. In J. A. Douglas (ed.) A New Flagship University: Changing the Paradigm from Global Rankings to National Relevancy (Palgrave Macmillan); http://scholar.harvard.edu/manja_klemencic/ns

Klemenčič, M. (2015) "The many dimensions of student-centred learning", HERE Conference "Innovating learning and teaching: the next phase of the Bologna Process", organised by the initiative 'Centralised Support for Higher Education Reform Experts in European Neighborhood countries (www.supporthere.org)', 3-4 December 2015, Ivane Javakhishvili Tbilisi State University, Tibilisi, Georgia.

Klemenčič, M. (2015). Internationalisation of Higher Education in the Peripheries: The 'gear effect' of integrated international engagements. In *Handbook Internationalisation of Higher Education (A 2.1-11), 22th supplement*, edited by Beerkens, E., Magnan, M., S Söderqvist, M. and H.-G. van Liempd. Berlin: Dr. Josef Raabe Verlag (Raabe Academic Publishers); http://www.handbook-internationalisation.com/

Klemenčič, M., Chirikov, I. (2015) On the use of student surveys. In Remus Pricopie, Peter Scott, Jamil Salmi and Adrian Curaj (eds.) *Future of Higher Education in Europe. Volume I and Volume II*. Dordrecht: Springer; http://scholar.harvard.edu/manja_klemencic/ns

Klemenčič, M., Šćukanec, N., Komljenovič, J. (2015) Decision Support Issues in Central and Eastern Europe. In Karen Webber and Angel Calderon (eds.) Institutional Research and Planning in Higher Education in a Global Context (Chapter 6, pp. 71-85). Routledge Press/Taylor & Francis; http://scholar.harvard.edu/manja_klemencic/ns

La MANCHE Project on 'Leading and Managing Change in Higher Education', which involves Armenia among other countries (http://www.lamanche-tempus.eu/); in particular the publication Changing Higher Education Institutions in Societies in Transition: In-depth Study Report (La Manche, 2014).

Marginson, S. (2015) Rethinking education, work and 'employability' Foundational problems of human capital theory. SRHE Annual Research Conference, 9-11 December 2015;

http://www.srhe.ac.uk/conference2015/downloads/Simon_Marginson_Presentation_SRHE_2015%20.pdf

Matei, Liviu, Julia Iwinska (Central European University, Budapest) and Koen Geven (European University Institute, Florence) (2013) Higher Education in Armenia Today: a focused review Report for the Open Society Foundation Armenia. Budapest: CEU Higher Education Observatory. http://www.osf.am/wp-content/uploads/2013/11/OSF_HE_report.pdf

Neave, G. (1998) The Evaluative State Reconsidered. *European Journal of Education*, Vol. 33, No. 3.

OECD - The Organisation for Economic Cooperation and Development (2014) Education at a Glance 2014. OECD Indicators. OECD Publishing; http://www.oecd.org/edu/Education-at-a-Glance-2014.pdf

Ohanyan , A. (2012) "The Academic Career in a Transition Economy: Case Study of the Republic Armenia". In Altbach et al. (eds.) Paying the professoriate: A global comparison of compensation and contracts. New York: Routledge.

PL4SD (2015) The PL4SD Country Reviews: Peer learning in practice, Institute of Advanced Studies (IHS), 2015.

Piketty, T. (2014) *Capital in the Twenty-First Century*. (translated by Arthur Goldhammer). Cambridge, MA: Harvard University Press.

Pinhero, R., Geschwind, L and T. Aarrevaara (2016) Mergers in higher education. *European Journal of Higher Education* 6(1) 2016.

Robertson, S. (2015) Higher Education: A Solution to, or Problem in, Rising Social Inequalities? A keynote at the 2015 SRHE Annual Research Conference, 9-11 December 2015; http://www.srhe.ac.uk/conference2015/downloads/Robertson-SRHE-2015-Keynote-Address.pdf

Sahakyan, V. (2014) Reforms in Research and Development Sector in Armenia. Policy Workshop Innovation Performance Review of Armenia, Yerevan, 14 November 2014.

Sahakyan, V. (2011) Reforms in Research and Development Sector in Armenia. Presentation in Tbilisi, November 1-3, 2011.

Smith, I. and T. Hamilton (2015) *Strengthening integrity and combating corruption in higher education in Armenia: Risk analysis of issues affecting the integrity of the Armenian higher education system*, Council of Europe, 2015.

UNECE - United Nations Economic Commission for Europe (2014) *Innovation performance: Armenia*.

UNESCO (2015a) UNESCO Science Report: towards 2030. UNESCO Publishing, 2015

University of Berkley – SERU (Student Experience in the Research University survey): http://www.cshe.berkeley.edu/SERU

World Bank (2013) *Addressing Governance at the Center of Higher Education Reforms in Armenia*, World Bank, 2013.

World Economic Forum and Mercer (2015) *Employment, Skills and Human Capital Global Challenge Insight Report: The Human Capital Report 2015*.

Appendix

A. List of interviews (Wednesday, 16 - 17 December, 2015)

Institution	Interviewees	Date	Duration
RA Ministry of Education and Science (responsible unit for HE strategy)	Karine Harutyunyan, Deputy Minister Robert Sukiasyan, Head of Department Tatevik Gharibyan, Policy Development of Higher and Postgraduate Education Harutyun Azgaldyan, Policy Development of Higher and Postgraduate Education Anush Khachatryan, Policy Development of Higher and Postgraduate Education Arayik Navoyan, Vice-recteur chargé des relations extérieures, de l'harmonisation des programmes éducatifs et de la qualité, Université Française en Arménie (UFAR) (external expert)	16.12.15; 17.12.15	1.5; 30′ (on the way to Parliament); 30′; 1.5
State Committee on Science	Samvel Harutyunyan, President of State Committee of Science Vardan Sahakyan, Deputy Chairman, State Committee of Science (Arayik Navoyan Vice-recteur chargé des relations extérieures, de l'harmonisation des programmes éducatifs et de la qualité, Université Française en Arménie (UFAR), external expert)	17.12.15	45′
ANQA, National center for professional (vocational and higher) education quality assurance	Ruben Topchyan, Director (www.anqa.am)	17.12.15	1
The Head of the Social Affairs Department within the Government of Armenia.	Astghik Mirzakhanyan (Tatevik Gharibyan, Ministry)	16.12.15	45′
National Assembly of the Republic of Armenia, Standing Committee on Science, Education, Culture, Youth and	Artak Davtyan, Chairman Ruzana Muradyan, member of the National Assembly (President of the Union of School-Centres), Deputy Karine Poghosyan, Deputy	16.12.15	1

Sports	(Karine Harutyunyan, Deputy Minister (Ministry); Ani Hovhannisyan, Ministry)		
National Erasmus+ Office in Armenia and Higher Education Reform Experts (Armenia)	Gayane Harutyunyan Samvel Karabekyan Kristina Tzaturyan Mary Hayrapetyan Lana Karlova, National Erasmus+ Office in Armenia (Tatevik Gharibyan, Ministry; Anush Khachatryan, Ministry)	16.12.15	1.5
National Information Centre For Academic Recognition and Mobility (ENIC-NARIC)	Gayane Harutyunyan Director of National Information Centre For Academic Recognition and Mobility; Head of the Bologna Secretariat (2012-2015	16.12.15	30′
Rectors' Council/ also members of National Academy of Sciences	Aram H. Simonyan, Rector Yerevan State University, corresponding member of the National Academy of Sciences Alexandr K. Grigoryan, Vice-Rector of Educational Affairs, YSU Gegham Gevorgyan, Vice Rector on Scientific Policy and International Cooperation YSU; member of the National Academy of Sciences Alexander A. Markarov, Deputy Vice Rector, Head International Cooperation, YSU Michael Narimanyan, Rector of Yerevan State Medical University after Mkhitar Heratzi Koryun Atoyan, Rector of Armenian State University of Economics (Harutyun Azgaldyan, Ministry)	17.12.15	1.5
Representatives from Armenian National Students'	Gohar (Gogo) Hovhannisyan, General Secretariat (http://www.ansa.am)	17.12.15	1.5

Association (ANSA)	Sargis Asatriants Mary Hayrapetyan (also HERE) 3 representatives (Anush Khachatryan, Ministry)		
Representatives from industry/business; university-industry/business cooperation	Enterprise Incubator Foundation (instead of Director of the Government Agency for IT development) Bagrat Yengibaryan, Director http://www.eif.am/eng/contacts/ NATIONAL POLYTECHNIC UNIVERSITY OF ARMENIA Foundation Vostanik Marukhyan, Rector; International Office (Head and one administrator) http://polytech.am/wpolytech/?page_id=4763&lang=en National Instruments Aram Salatyan, Director http://www.itguide.eif.am/index.php?id=22&lang=0#top Microsoft Innovation Center in Armenia Artashes Vardanyan, Startup Acceleration Program Manager http://www.mic.am/pages/about-us/ Representative of Microsoft Office in Armenia Liana Korkotyan, Country Manager of Microsoft RA http://www.spyur.am/en/companies/microsoft-ra-representative-office-of-microsoft-corporation-in-armenia/5277 (Anush Khachatryan, Ministry)	16.12.15	1
Council of Europe /Academic integrity project	Liana Amirbekyan, Senior Project Officer (strengthening integrity and combating corruption in HE in Armenia), Council of Europe Office in Yerevan (Anush Khachatryan, Ministry)		30′
Total		42	14h

B. List of official documents and policy studies

Policy studies/reports

ANSA (2015) Bologna System in Armenia. The Student Perspective. Organisation for Security and Cooperation in Europe (OSCE), 2015

Arzumanyan, T. (2014) ARMENIA: Country Report, Information Exchange in Science and Technology between the European Research Area and Eastern European/ Central Asian Countries, IncoNet Eastern Partnership, Head of International S&T Programs Department, National Academy of Sciences of Armenia

Athena Project (2015) The Athena Project on 'Fostering Sustainable and Autonomous Higher Education Systems in the Eastern Neighboring Area', which involves Armenia, Moldova and the Ukraine, (A Tempus IV Project), European Commission, 2015; http: www.athena-tempus.eu

Budaghyan, A.S., Harutyunyan K. V., Tsaturyan, K.G., Santurjyan M.G. (2015) Reforms in higher education of Armenia in the context of the Bologna process, National centre for strategic research in higher education, Yerevan, 2015

CHEPS (2008) Formulating the Financing Principles and Exploring Alternative Financial Mechanisms for Armenian Tertiary Education, World Bank, 2008

European Commission/EACEA/Eurydice (2015) The European Higher Education Area in 2015: Bologna Process Implementation Report. Luxembourg: Publications Office of the European Union.

Eurostudent (2015) Social and Economic Conditions of Student life in Europe 2012-2015, Eurostudent V, Eurostudent, 2015

EU Twinning Project (2015) Empowerment of the Tertiary Level Education of the Republic of Armenia for European Higher Education Area (EHEA), European Commission, 2015

EV Consulting (2014) National Competitiveness Report of Armenia, 2013-2014, EV Consulting, Economy and Values Research Center, 2014

EV Consulting (2014) IT Skills Assessment in Armenia, EV and World Bank Case study, 2014

EV Consulting (2012) Public support to higher education in prioritized areas of economy, EV Case study, Yerevan, 2012

EV Consulting (2010) The Story of the Emerging IT Cluster in Armenia, EV Case Study, 2010

European Commission (2015) Implementation of the European Neighbourhood Policy in Armenia Progress in 2014 and recommendations for actions, European Commission, Joint staff working paper, European Commission 2015

Harutyunyan, K. and K. Tsaturyan (2012) Financial and Social Support to Students in Higher Education Institutions of Armenia: Analysis of the Issues and Recommendations. EUA Funding Forum, 2012 http://www.eua.be/Libraries/funding-forum/K_Harutyunyan_and_K_Tsaturyan.pdf?sfvrsn=0

Karakhanyan, S., van Veen, K. and T. Bergen (2011) Educational Policy Diffusion and Transfer: The Case of Armenia. *Higher Education Policy*, 2011, 24, (53–83)

Khnkoyan, A. (2011) Development of Scientific and Innovation Policy in Armenia in 2000s. *Atlanta Conference on Science and Innovation Policy 2011*. ACSIP11 General Papers. Georgia Institute of Technology.

La MANCHE Project on 'Leading and Managing Change in Higher Education', which involves Armenia among other countries (http://www.lamanche-tempus.eu/); in particular the publication Changing Higher Education Institutions in Societies in Transition: In-depth Study Report, La Manche, 2014

Matei L. and K. Geven (2013) Higher Education in Armenia Today: a focused review. Report for the Open Society Foundation Armenia. CEU Higher Education Observatory Budapest, 2013

National Research Council of the National Academies (2004) Science and Technology in Armenia. Towards a knowledge-based economy. Committee on Science and Technology in Armenia, Office for Central Europe and Eurasia Development, Security, and Cooperation, National Research Council. Yerevan: National Academies Press.

Paramonov, S. (2014) Regional research report: a summary of key research performance indicators for Republic of Armenia, Thomson Reuters, 2014

PL4SD (2015) The PL4SD Country Reviews: Peer learning in practice, Institute of Advanced Studies (IHS), 2015

Sahakyan, V. (2011) Reforms in Research and Development Sector in Armenia. Presentation in Tbilisi, November 1-3, 2011

Sahakyan, V. (2014) Reforms in Research and Development Sector in Armenia. Policy Workshop Innovation Performance Review of Armenia, Yerevan, 14 November 2014

Sargsyan, Yu L. and Budaghyan A. S. (2007) Current state, development trends and problems of the Bologna Process in EHEA and Armenia, National center for strategic research in higher education, Open Society Foundation, Armenia, 2007

Saroyan, A. (2008) Quality Assurance in Higher Education in the Republic of Armenia: Analysis and Recommendations, World Bank, 2008

Smith, I. and T. Hamilton (2015) Strengthening integrity and combating corruption in higher education in Armenia: Risk analysis of issues affecting the integrity of the Armenian higher education system, Council of Europe, 2015

Technopolis (2010) Study on the organisation of doctoral programmes in EU neighbouring countries: Armenia, Technopolis, 2010

TEMPUS Country Fiche "Higher Education in Armenia", Education, Audiovisual and Culture Executive Agency (EACEA), 2012

UNESCO (2015a) UNESCO Science Report: towards 2030. UNESCO Publishing, 2015

UNESCO (2015b) Education for All 2015 National Review: Armenia. UNESCO Publishing, 2015

UNECE - United Nations Economic Commission for Europe (2014) Innovation performance: Armenia, UNECE, 2014

World Bank (2013) Addressing Governance at the Center of Higher Education Reforms in Armenia, World Bank, 2013

Policy documents

Armenia Development Strategy for 2014-2025, RA Government Decree, 27 March 2014

Programme on subsequent integration of the higher education system of Armenia into the European Higher Education Area, RA Ministry, 2012

Strategy on Development of Science for 2011-2020, May, 2010

(draft) Education Development 2016-2025 State Programme, December 2015

Legislative documents

Government of Armenia (1999) The Law on Education, 1999

Government of Armenia (2001) The Law on State Non-Commercial Organizations (SNCOs)

Government of Armenia (2004) The Law on Higher and Postgraduate Professional Education, 2004

Government of Armenia (2000) Law on the Scientific and Technical Activities, 2000

Government of Armenia (2011) Law on the National Academy of Sciences of RA, 2011

Government of the Republic of Armenia Decision 332-N on Approval of National Qualifications Framework of the Republic of Armenia, 2011

Statistical Data

Eurostat, Eastern Partnership, 2015

Statistical Yearbook (2015) National Statistical Service of the Republic of Armenia, 2015

World Economic Forum (2015) The Global Competitiveness Index 2015-2016: Armenia, World Economic Forum, 2015

World Economic Forum and Mercer (2015) The Global Human Capital Report 2015, World Economic Forum and Mercer, 2015

Websites

Ministry of Education and Science; http://www.edu.am

Ministry of Economy; http://www.mineconomy.am/eng/index.html

National Center of Innovation and Entrepreneurship; http://www.innovcentre.am/en/index.php?page=inf, member of Interstate Council on coordination of scientific and technical information of CIS member-states.

National Centre for Professional Education Quality Assurance Foundation (ANQA); http://www.anqa.am/en/PoliciesandProcedures.aspx

National Information Centre for Academic Recognition and Mobility (ENIC); http://www.armenic.am

National Academy of Sciences of Armenia; http://www.sci.am/resorgs.php?oid=31

National Erasmus+ Office in Armenia; http://erasmusplus.am/useful-links-2/

IncoNet EaP and IncoNet CA (STI International Cooperation Networks for Eastern Partnership Countries/Central Asian Countries; http://www.increast.eu/en/1121.php

Enterprise Incubator Foundation (EIF); http://www.eif-it.com/index.php?page=news

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