

Internationalization, Technologies and Their Hindering Factors in the Post-Soviet Scientific Space (Georgian Case)

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Abstract— The research conducted by a group of researchers provides an analysis of main challenges for the Georgian scientific society. Despite Georgia already being a member of the Bologna process for seventeen years, there are a series of problems that still need to be addressed in order to provide the sustainable development in the country regarding Internationalization. Among these problems we believe that supporting mechanisms for academic personnel activities in Georgia (assigned resources: time, equipment, finance, professional development (especially IST and language skills and etc.) are weak and the researchers cannot devote enough time to conduct researches, create a valuable product and therefore contribute to the development of the country on a way of Internationalization. The research describes Georgian: The real situation with the challenges and problems the academic personnel face and proposes possible ways to overcome and solve them for further development of the field. Accordingly, it is important to develop and use the potential of the country in the context of the European scientific community on the way to globalization. As a result, the country's current situation, problems, challenges and findings were studied, which prevented the development of the potential of the Georgian scientific space. Which is directly related to globalization.

Index Terms—Scientific space in Georgia, Internalization in Georgian scientific space, Technologies in science, Globalization and Science.

I. INTRODUCTION

Evaluation of research capacities of higher educational institutions of Georgia is a significant challenge and at the same time certain opportunity for our country. This research aims at the revealing of the factors hindering the development of science in Georgia, their identification and objective evaluation of the capacities of higher educational institutions of Georgia.

Cooperation and competition are the major strategies for the internationalization of studies. The success of the internationalization process depends on these two factors. Educational institutions must prepare specialists for “international dimension” and they must not be limited to only by international mobility of students. The mentioned is grounded by the Bologna Process [1]. Georgia has been involved in it since 2005 and its prerequisite was signing of documents such as the Great Charter of Universities (1988, Bologna), Lisbon Convention (1997, Lisbon) [2] and Sorbonne Declaration (1998, Sorbonne) [3]. Internationalization of higher education and researches [1] is a necessary requirement for all these documents. Despite the mentioned, the subject of research still remains as a challenge for our country.

The law of Georgia On Science, Technologies and Their Development [4] is also noteworthy, its Article 2 declares state policy in terms of science and technologies, namely, according to the point, f’ of the mentioned Article, state considers the development of international scientific cooperation as one of the priorities.

The necessity to strengthen the internationalization process is also presented in the Unified Strategy of Education and Science for 2020-2030 [5], which notes that „Considering the current small number of international personnel and doctoral candidates and the non-existence of a comprehensive strategy of internationalization, there is a lack of diversity in higher education, research and in the field of innovations.”

For research purposes it is interesting to what extent do the regulations existing in the country reflect the official state policy? Of course, Georgian legislation regulates the issues of legal regulation of higher educational institutions, standards of their authorization [6], accreditation of educational programs [7], which, in their turn, pay great attention to the need for the internationalization of science and researches, all higher educational institutions have the internationalization policy documents according to the requirement of law, though, the practice shows that in most cases the reports submitted by higher educational institutions in this regard are directed more at the formal observance of standards rather than the implementation of the real process of internationalization.

Regarding above mentioned study there have been main research questions:

- ☐ To what extent do the existing regulations in the country reflect the declared state policy on the way to the Internationalization of the country?
- ☐ What scientific potential exists in the higher educational space and what are the main challenges faced by Georgian researchers?
- ☐ What measures are carried out by educational institutions for the Internationalization of research in Georgia?

Data collection methodology:

- ☐ Study current situation and regulations in the direction of research: data collection and analysis;
 - ☐ Database about scientists - processing of statistical information about the number of researches, qualifications, studies;
- It is important to emphasize that the study contains the results of the authorization of higher educational institutions that were carried out in 2018-21 [8]. Respectively, the secondary comparative analysis of the regulations existing in the country and of the mentioned authorization reports (11 University) have been conducted (Desk review). As it has been already mentioned, Georgia has been a participant in the Bologna process since 2005 and has been carrying out reforms for years. Accordingly, it is important to develop and use the potential of the country in the context of the European scientific community on the way to globalization. As a result, country's current situation, problems, challenges and findings were studied, which prevented the development of the potential of the Georgian scientific space. Which is directly related to globalization.

I. RESEARCH PART

After the comparative analysis of the above-mentioned universities and the normative acts developed by the state in the education system the following was revealed: in higher educational institutions of Georgia, general policy for conducting research has been developed on the basis of legislative requirements. The system of evaluation and analysis of productivity of the research activities of academic and scientific personnel, mechanisms for encouragement of participation in the research process and university-based support of research activities, structures of organisational support of research activities, internal system for financing of research events have been developed and are operating, informational support of university-based studies is provided, events for organisation and support of research are held. The support provided by those technological infrastructure (internet, support provided by computer park, online library resources and other trainings of ICT skills), which are ensured by universities for conducting research. Therefore, the requirements of 6th and 7th standards of the Regulations on Authorization in terms of regulations and infrastructure are positively evaluated by experts [6]. But they also note that despite the mentioned in certain cases some of them have absolutely formal character, this particularly concerns regional higher educational institutions. The situation is comparably better in the capital, which is caused by the following factors: independent research units are institutionally integrated in them (in total 49 research institutes [8]), which are financed by the state budget, though it should also be mentioned that functional integration of higher educational institutions and the research institutes functionally integrated in them has not been implemented yet; Higher educational institutions have separately stipulated in their budgets the costs for research activities, where the internationalization costs are separately determined, though in many cases low budget does not satisfy real demands; Considering the advantage of the geographical location highly qualified staff of scientists and researchers is more concentrated in the higher educational institutions of the capital, which raises the chances of successful participation in grant projects for the institution; The facts of mobility of both academic and scientific personnel and students are more frequent, working visits of foreign professors and researchers are comparably frequent, which, in its turn, promotes the internationalization process;

Based on the Agreement between the EU and Georgia [9] On Participation of Georgia in the EU's Research and Innovation Programme "Horizon Europe" signed in 2021 [10], the works are continued for the strengthening of internationalization of higher education, research and innovation on the basis of the EU policy framework, initiatives and different opportunities offered under the programs".

In terms of internationalization, as one of the instruments for promotion of research – universities have also created supportive mechanisms and the following have been determined:

1. Creation of the conditions for social and cultural adaptation for foreign students;
2. Involvement of foreign faculty members in the teaching and research process;
3. Preparation and issuing of study materials and other supplementary sources in a foreign language;
4. Integration in existing international educational and scientific networks and execution of agreements with foreign educational institutions;

5. Strengthening of relations with international organizations and funds; strengthening of international cooperation at the level of faculties;

6. Involvement of teachers, scientists and administrative personnel in exchange programs etc. [11];

The direction of joint programs and dual diplomas is not developed at universities, especially at Master's and doctoral levels, which would be a step forward in the direction of internationalization of research;

The research question given below: What scientific potential does there exist in the higher educational space and what main challenges do Georgian scientists/researchers face? According to the data of 2019-2021 of the National Statistics Department [12], the number of scientists according to the level of education in Georgia is the following:

Table #1

	2019			2020			2021		
	total	woman	man	total	woman	man	total	woman	man
Researchers in total, among them:	10 191	5 339	4 852	11 859	6 354	5 525	12 030	6 408	5 622
Doctor or equal (ISCED 8)	7 277	3 818	3 460	7 992	4 208	3 784	8 381	4 421	3 960
Master or equal (ISCED 7)	2 756	1 420	1 336	3 099	1 620	1 479	3 324	1 776	1 548
Bachelor or equal (ISCED 6)	188	113	75	266	147	119	310	184	126
Short term vocational (ISCED 5-4)	-	-	-	2	2	-	3	3	-

Source: 2019- Sakstat; from 2020- The Ministry of Education and Science of Georgia

it is noteworthy that the number of scientists rises as years pass.

There are also important data on the number of scientists with regard to the age, where it is clearly visible that significant increase is revealed between the ages 25-34 and 45-54, which must be viewed as a positive tendency

Table #2

	2019			2020			2021		
	total	woman	man	total	woman	man	total	woman	man
Researchers in total, among them:	10 191	5 339	4 852	11 859	6 354	5 525	12 030	6 408	5 622
Natural Sciences	2 398	1 137	1 261	2 277	1 082	1 195	2 284	1 084	1 200
Engineering and Technology	1 781	580	1 201	2 127	719	1 408	2 136	739	1 397
Medical and Health Sciences	1 369	810	409	1 887	1 187	700	1 880	1 218	662
Agriculture/Veterinary sciences	442	242	200	474	276	198	420	240	179
Social Sciences	2 324	1 216	1 108	2 769	1 487	1 302	3 088	1 638	1 450
Humanitarian Sciences and Arts	1 799	1 213	576	2 308	1 581	727	2 234	1 486	748
unclassified	88	41	47	37	20	17	1	-	1

Source: 2019- Sakstat; from 2020- The Ministry of Education and Science of Georgia

The number of researchers according to the fields is also interesting, which is a significant indicator in terms of measuring of the effectiveness of the state policy.

Table #3

	2019			2020			2021		
	total	woman	man	total	woman	man	total	woman	man
Researchers in total, among them:	10 191	5 339	4 852	11 859	6 354	5 525	12 030	6 408	5 622
<25	111	67	44	170	86	84	1712	408	943
25-34	1 187	607	580	1 820	833	689	1704	882	822
35-44	1 907	1 161	746	2 172	1 339	833	1987	1 183	794
45-54	2 102	1 198	904	2 479	1 428	1 047	2308	1 274	934
55-64	2 048	1 058	987	2 428	1 237	1 193	2418	1 286	1 032
65+	2 828	1668	1 161	3 073	1 712	1 361	2818	1 508	1 310

Source: 2019- Sakstat; from 2020- The Ministry of Education and Science of Georgia

Though, in spite of the fact that the above-mentioned indicator is not so bad, it must be noted that after the collapse of the Soviet Union, all former republics and in particular, Georgia have faced great problems and challenges in terms of science and research.

The research has revealed more or less deficit of qualified researchers and experienced academic personnel in higher educational institutions of Georgia; The lack of conducted researches affects the quality of research results and hinders the development of research culture in higher educational space. Herewith, the scarcity of experienced academic personnel, who can do the mentorship and supervision of students in terms of research, negatively affects the research capacities of the higher educational institutions of Georgia;

It is important that today the average age of scientists is 70 and above, in spite of their experience in research, most of them have the barrier in terms of English language, which is important for the internationalization process, also, there are problems in terms of the access to modern technologies.

The process of integration of higher education and science still has not been completed, namely, their material and functional synthesis has not been performed; therefore, the involvement of scientists in the preparation/development of educational programs and the involvement of master's and doctoral students in research projects is scarce;

The practice of publishing of papers of master's students, doctoral students and especially scientists in peer-reviewed journals indexed e.g. in Scopus, Web of Science, ERIH PLUS or in other international scientific peer-reviewed journals is scarce;

One of the major challenges reported by the respondents is the lack of financing of research activities. Many institutions fight for ensuring sufficient financial resources in order to support research projects, for purchasing of necessary equipment and for ensuring of facilitation of research for faculty members. Herewith, "the existing model of state funding pays less attention to the quality and productivity of research, allocated money is directed at universities and not at research institutes. The problems existing in the field of research and innovation is supplemented by less participation in the planning of this sector by the state, non-existence of clearly defined direction, which is expressed in the existence of more than 80 prioritized research fields" – as noted in the strategy document [5].

It is noteworthy that unlike public universities, in private universities academic personnel receives remuneration only for lecture hours and with regard to the research activities, the costs related to the publishing of research works, their presentation at conference and costs related to other similar activities. Though, in private institutions there does not exist an hourly remuneration allocated for research. Therefore, there exists a minimum margin for lecture hours and the remaining time must be used for research work from full time. In practice, there also exist bonuses for scientific work and not only for publishing papers and participating in other research activities; After the dissolution of the Soviet Union the issue of renewal of research infrastructure is quite serious. In higher educational institutions the infrastructure hinders the research capacities. Insufficient laboratory items, outdated technology and limited access to the research database prevents the capacity of the researchers to conduct high quality researches.

The ability of researchers to conduct researches using modern equipment, to participate in international conferences and to cooperate with foreign scientists in order to develop the internationalization of research is insufficient and limited.

The research has revealed that the collaboration of scientists and researchers has episodic character, which limits the sharing of knowledge and resources, prevents joint research capacities of institutions.

At universities, there does not exist a structural unit, which helps the personnel in writing grant projects or in submitting proposals, as the lack of competence is noticeable in this field;

The evaluation reports on the results of the activities of academic personnel and also their analysis is not public in order to ensure openness and transparency;

It is also important that the lack of recognition of research activities and the lack of motivation has negative affect on the research capacities. Non-existence of the system based on merit and the limited career advancement based on research results causes demotivation in researchers.

There are no supportive mechanisms, which would encourage the participation of academic personnel in grant and project research programs;

It must also be noted that for the purposes of internationalization of research and development of inclusion of technologies, it is very important to know scientific English. As in the past, in Soviet reality the researches were mainly conducted in Russian, up to this day, most of scientists use the sources exiting in Russian, which is a hindering factor and leaves the modern scientific space without the opportunity to introduce and analyse modern scientific knowledge. It should be

mentioned that in a number of universities, they still use the outdated literature in Russian while conducting research, which puts their reliability under question. As for the innovations and modern technologies, knowledge of English is a decisive factor here as well. Though in the analysed documents it is clearly visible that the language barrier still stays as a big problem in almost all private and public universities.

Lack of knowledge of English is a serious challenge in research work. The researchers, who use English, as a communication language, are involved more actively in international researches and they often publish articles together with foreigner co-authors in journals with Impact Factor. There are cases, when group of experts underlines good indicator of internationalization of university, though it also notes that ‘‘much is left to be done for the improvement of knowledge of English by academic personnel, in order to promote research capacities and integration in international research environment’’ [8].

CONCLUSION:

To conclude, it must be said that after Georgia has become the participant of the Bologna Process and the implementer of its policy in the country in terms of education in the way to Euro integration, at the level of state regulations, it has ensured the harmonization of all policy documents. The mentioned resulted in important steps towards internationalization and, therefore, globalization. In this regard, the announcement of the Government of Georgia is important – ‘‘with the effort of the Government all levels of education, also, the internationalization of research and innovations will be promoted’’ [5]. Despite the mentioned, the country still cannot recover from those problems, which were regarded as problems existing in Soviet Union. More than thirty days have passed after the dissolution of the Soviet Union and the country still has not freed itself from its jaws. The issue of competence of scientists is still topical. Such as academic good faith, overcoming of the technical skills and the language barrier necessary for the creation of a new research knowledge and for competitiveness, integration of research and teaching and readiness for other modern innovative challenges. Which, in its turn, will help the country shatter ugly Soviet jaws on the way to internationalization and globalization once and for ever; approaches with bad faith, which would really make the scientific space of the country healthier.

Recommendations:

Having analysed the research results and conclusions the group of researchers presented the following recommendations:

On the part of the state:

- ✓ to create unified online portal for research, which would help interested parties obtain protected and reliable information on scientists;
- ✓ Existence of unified electronic data platform in order to ensure the publicity and transparency of processes, where it will be easy to search for information on scientific institutes, authors of articles and other important data, in order to create a research profile for each institution and/or the units existing in it;
- ✓ Objective and strict monitoring of the requirements of accreditation and authorization standards, the standards set for doctoral programs and generally for researches must be specified.
- ✓ The state must regulate the issue of remuneration of scientists and researchers in a single action;

On the part of universities:

- ✓ Transferring of the collaborative relations determined under the memoranda executed by higher educational institutions and research units into an active phase;
- ✓ In order to improve the research outcomes, formation of the internal evaluation system for research outcomes of each direction and clear indicator of the quality of the publications of higher educational institutions and of the ethical research;
- ✓ Development of the strategies for the evaluation of research activities by higher educational institutions and implementation of internationalization of research activities;
- ✓ Increasing of activities of higher educational institutions in order to attract money from international and other local funds;
- ✓ Creation of joint and dual programs, together with foreign partners;

In terms of strengthening of the competence of academic personnel:

- ☐ academic personnel must be provided with more opportunity and support in order to submit grant and project proposals;
- ☐ more complex approaches must be developed for the evaluation of research, considering the results of each researcher, research tools and the work of other units;

□ it is important for universities to ensure the publicity and transparency of defence of doctoral theses; more filter, namely, the approval of the doctoral thesis by the respective faculty council and at the next stage, by the academic council of the university, or by its other central unit.

□ It is important to increase support, the practice of publishing of the papers of master's students, doctoral students and especially scientists in peer-reviewed journals, which are indexed e.g. in Scopus, Web of Science, ERIH PLUS and/or other international peer-reviewed scientific journals;

Universities must determine the indicators of the performed work, such as the number of research papers and other publications in international peer-reviewed journals, which is expected by the university from each faculty and research centre annually and apart from that, to apply other existing measures in order to determine where to draw more attention in terms of the improvement. This way, the work of all affiliate and invited personnel and, therefore, the faculty may be easily evaluated.

□ It is desirable for the academic personnel to have certain support in terms of the teaching of foreign languages and modern technologies;

□ It is important for the universities to develop the policy for supporting, attracting and maintaining young scientists;

□ It is important to increase the funding for scientists, both at state and university level, in order to promote research activities; This would ensure the equipment necessary for researches and the professional development of the academic personnel. Despite the fact that universities have lots of different doctoral and master's programs, they are conducting the researches in limited directions;

□ It is also important to broaden scientific space at higher educational institutions, to integrate teaching and science, also, to diversify it, which will ensure in future the improvement of the institution in this regard;

□ it is recommended that a standing research ethics commission exist at universities, which would regularly (and not on an ad hoc basis) perform the quality analysis of research activities and works on permanent evaluation of the researches of academic personnel, which will finally ensure the achievement of the goals of their strategic plans;

□ It is important for an educational institution to care for an individual researcher and his/her career advancement, which includes the promotion of the mobility of researcher by the higher educational institution of the researcher, attraction of the funds promoting innovative activities;

□ An educational institution should provide collaboration at global level with the respective research units of its fields, based on that, real opportunities for the involvement in international research will be created and the necessity to participate in the target events of international innovative networks will be determined;

□ Higher educational institutions should permanently promote the international research cooperation of researchers by identifying big and complex social challenges, determining the research profile of an institution and promoting of the involvement of researcher in respective research groups.

□ Higher educational institution should reconsider the approaches to the employment of a researcher, promote the employment of researchers across the world in various research projects and offer them the opportunity of lifelong contract.

REFERENCES:

1. Joint Declaration of the European Ministers of Education convened in Bologna June, 1999;
2. Convention on the Recognition of Qualifications concerning Higher Education in the European Region, Lisbon, Portugal, 1997;
3. Joint declaration on harmonization of the architecture of the European higher education system by the four Ministers in charge for France, Germany, Italy and the United Kingdom in Paris, the Sorbonne, May 25th 1998;
4. Georgian Parliament, "Georgian Law of Science, Technology and its development" 14, December 2006;
5. Ministry of Education and Science of Georgia "2022-2030 Unified National Strategy of Education and Science of Georgia", p.29; 2022; <https://mes.gov.ge/content.php?id=7755&lang=eng>
6. Georgian Parliament, "Georgian Law of Education Quality Development" 5, August 2010;
7. Minister of Education and Science of Georgia, the "approval of regulation of accreditation of educational programs of educational institutions and it's fees"- Order No. 65/N of May 4, 2011 Tbilisi;
8. National Quality Enhancement Centre, Conclusions of authorization experts, 2018-2021, Tbilisi; <https://eqe.ge/ka/page/parent/891/avtorizatsiis-shemdgomi-shefasebebi>
9. Minister of Foreign Affairs of Georgia, „Association Agreement between Georgia on the one hand and on the other hand the European Union and the European Atomic Energy Union and their member states“; No 200/42; 27, June 2014, Tbilisi;

10. [10] European Commissioner and the Minister of Education and Science of Georgia, signed an agreement “That grants Georgia the status of association with the European Union's research and innovation program, Horizon Europe (2021-2027)” 7, December, 2021, Tbilisi;
11. Minister of Education and Science of Georgia, the “approval of regulation of Athorization of educational institutions and it’s fees;No07/N of 31, January 2018 Tbilisi;
12. Data of the Statistics Department of Georgia, 2023;
13. <https://www.geostat.ge/ka/modules/categories/194/metsniereba>