

## **Challenges of Higher Education Learning and Scientific Research Process Management**

**Ekaterine Gulua**

*Department of Economics, Tennessee State University TSU, United States.*

### **Keywords**

Higher Education  
Management,  
Management of  
Academic Staff,  
Learning Process  
Management,  
Scientific Process  
Management.

### **Abstract**

*This work is dedicated to the 100th anniversary of the First University of Georgia and aims to find ways to improve management policies of higher education institutions in Georgia. The study was based on the analysis of foreign experience of modern strategies of higher education management, the qualitative analysis of TSU management system and the survey of academic personnel of the university economics and business faculty. Based on the results obtained, the challenges of management and scientific process management are analyzed. Challenges identified in the paper are informative not only at TSU but at other higher educational institutions of Georgia for understanding the conditions there and it will be the basis for the mechanisms of overcoming challenges at higher education institutions and management improvement recommendations.*

### **I. Introduction**

Ivane Javakhishvili Tbilisi State University (TSU) is the oldest educational institution in the South Caucasus region and is the largest in Georgia. This university is elected by the best school leavers from every corner of Georgia. The processes taking place in the university, the quality of teaching, the management system, the forms of established relationships spread everywhere and influence the whole country. Consequently, management of the challenges of this university should be a priority for the country's policy.

The present work is a continuation of the previous research, which was devoted to studying the perceptions of university challenges by students (Gulua, Ekaterine, 2017). Students' survey revealed twenty-five major challenges. The questions answered by the lecturers gave us an opportunity to make more concrete conclusions and compare their results to students' opinions. Although student polls preceded a survey of academic staff, the questionnaire was made simultaneously. These two studies are the integrity of the parts of the unified research system.

Improvement of management processes based on the challenges of higher education institutions is the purpose of this work, along with other researchers conducted under the auspices of the Human Potential Laboratory, whose results are

published in both local and international conference proceedings and scientific journals (Kharadze, Natalia; Gulua, Ekaterine, 2016), (Kharadze, Natalia; Gulua, Ekaterine, 2017); (Kharadze, Natalia; Gulua, Ekaterine; Dugladze, Davit, 2017); (Gulua, Ekaterine; Kharadze, Natalia, 2017); (Kharadze, Natalia; Gulua, Ekaterine, 2017); (Kharadze, Natalia; Gulua, Ekaterine, 2018).

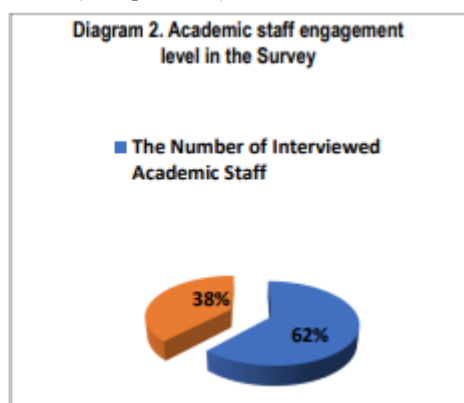
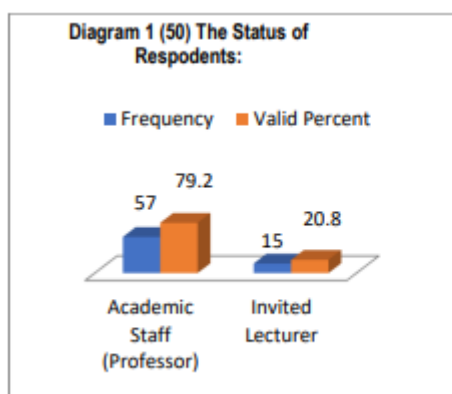
Academic staffs of the Faculty of Economics and Business and invited lecturers were selected as a research object. Although the research is limited to one faculty staff, it provides the basis for analyzing the unified management system of the TSU, because structural units are governed by the centralized rule, faculties do not have the sharply expressed autonomy, the specific system of governance. The questionnaire included 48 closed and two open questions. To a number of questions, according to their content, a respondent could write several answers, so the percentage of answers to these questions exceeds one hundred percent. The data was developed in the program "SPSS-Statistics". A survey based on a questionnaire was conducted in March 2017.

The results of the survey were divided into two main parts: 1. Challenges of learning and scientific process management; 2. Infrastructural and systematic management challenges. The present work is only the first part of the study, which includes two main directions:

*Challenges of teaching process management.*

*Challenges of scientific process management.*

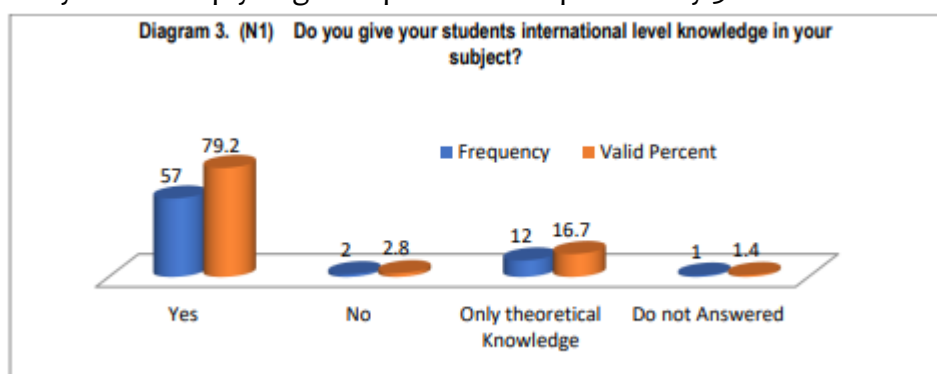
At the time of the research, the academic staff of the Faculty of Economics and Business composed of 92 members, the number of temporary invited staff is not permanent – it changes according to the terms and years. 150 questionnaires were distributed to all the departments. The survey was conducted in compliance with the anonymity of respondents. 72 respondents filled out the complete questionnaire, 2 respondents filled out only partially, the responses of the latter were excluded from the research. 57 members of the academic staff participated (62% of total staff) into the survey, 15 were invited lecturers (see the Diagram 1). 52 blank cards were returned. 79.2% of the respondents were academic staff (Diagram 2).



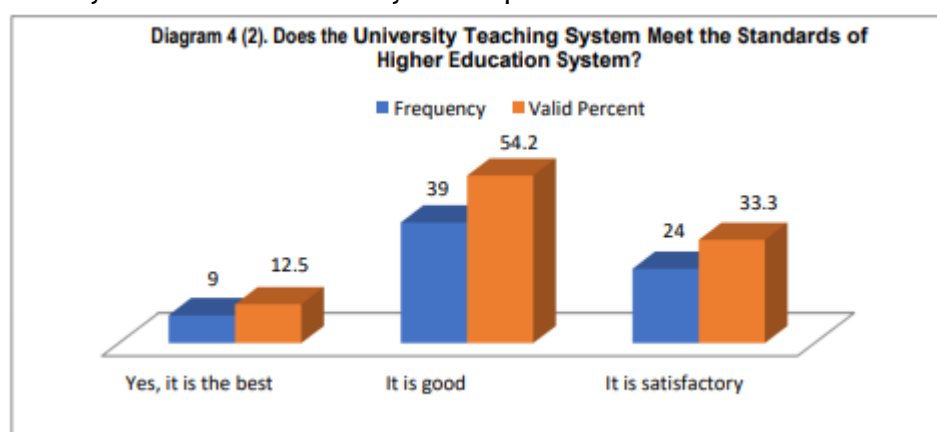
### Challenges of Teaching Process Management

Teaching process of higher education institution is to give the students a modern, international level education that will give them a global competitiveness, as the countries are more or less participants of global relations, only the education of local significance and level cannot give graduates a guarantee of employment, success,

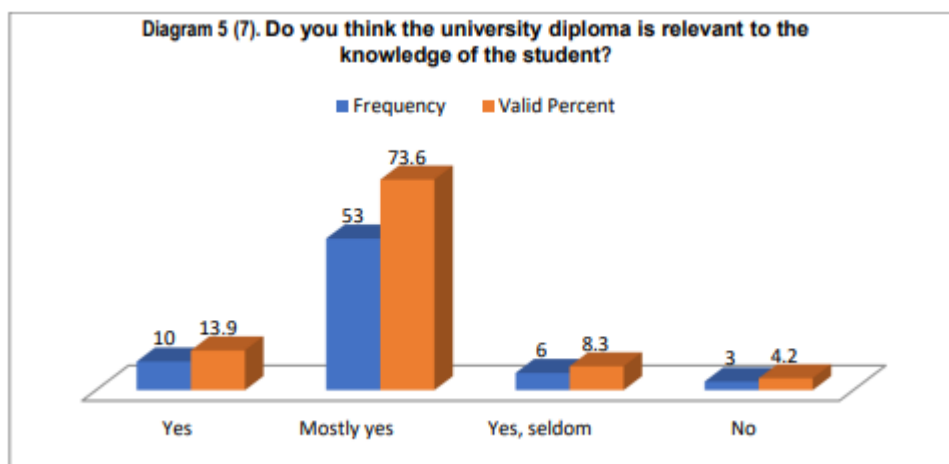
possibility of professional self-realization. Naturally, the subject of interest is determining how this issue is evaluated by the lecturers. 79% of the lecturers believe that they give students the knowledge of international level. The response of 3% is extremely negative – they believe that they do not transmit the knowledge of international level, 17% states that they only transmit theoretical knowledge (Diagram 3). The students' answers to this question are somewhat different, only 16% of the students have a positive response to this question; the vast majority of the students consider that they get such knowledge only in some subjects (Gulua, Ekaterine, 2017). In general, unfortunately, only 12% is confident that they will have knowledge of international level after completion of the study - and sharply negative position is expressed by 31% of the students.



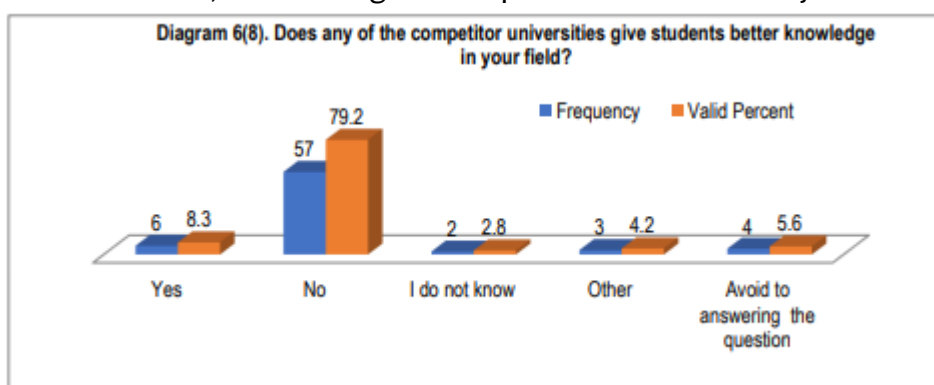
The university teaching system is estimated as best by 12.5% of the lecturers; Well 54% thinks that it is good; 33% considers that it is satisfactory (Diagram 4). It should be noted that higher education institutions and the relevant programs periodically go through the authorization and accreditation procedures which provide the compliance of the country's highest level of education with modern requirements, in order to be considered the interests of the country, as well as of the students, as future work force and key factors of the country development.



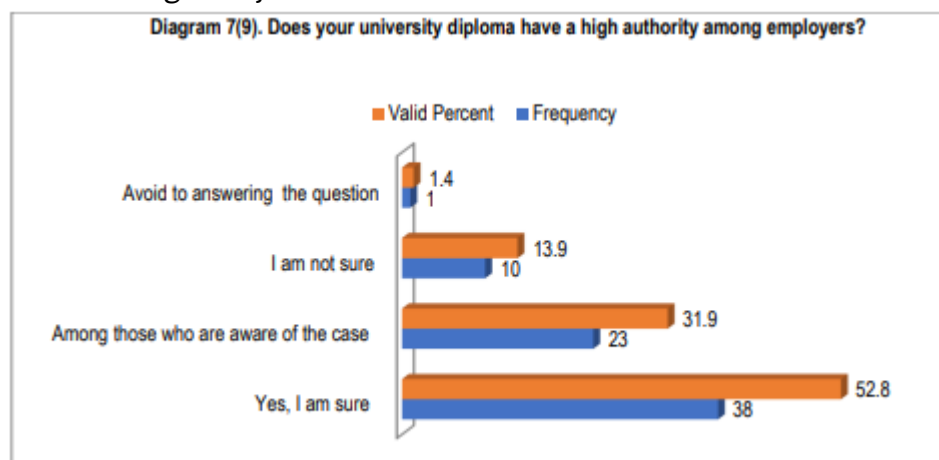
14% of the respondents believe that the diploma issued by the university is relevant to the student's knowledge, 74% thinks that the diploma is mostly in line with the relevant level of knowledge, and 12.5% of the respondents have relatively negative responses (Diagram 5). According to the student survey, 11% thinks that after completing their studies they will have the relevant knowledge, 72% thinks they will have only theoretical knowledge, 17% of the respondents' position in this direction is very negative.



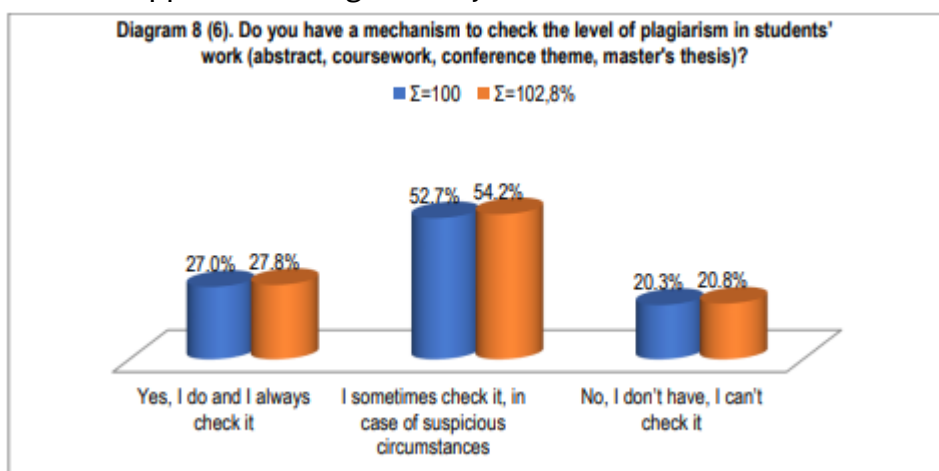
8,3% of the interviewed lecturers believe that competing universities give students better knowledge than TSU. 79.2% rate the advantage of TSU (Diagram 6). Positive perception of the university's image by the students is far below the level of the lecturers. 34% shows that throughout Georgia the best level of knowledge to receive is available at TSU, and the negative response was recorded by half of the respondents.



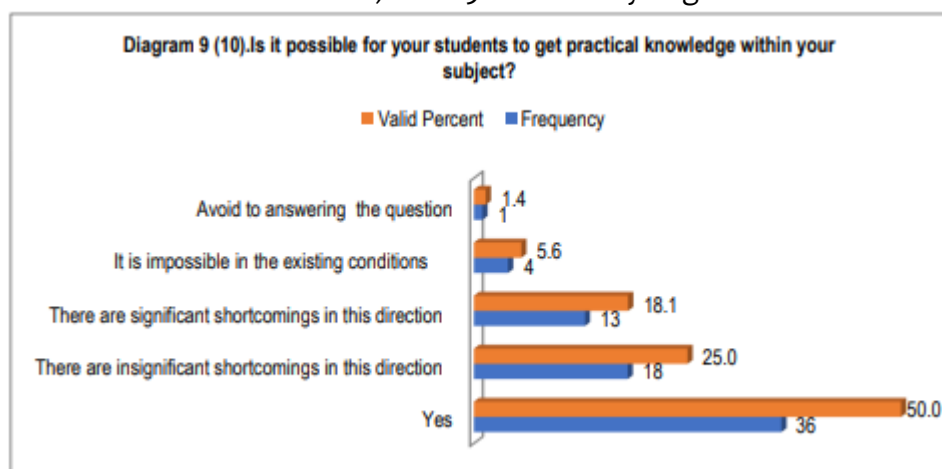
53% of the interviewed academic staff members are convinced that TSU alumni use high authority among employers, 32% thinks TSU is preferred by the category of employers who are aware of the case. The University authority is dubious for 14% of the respondents (Diagram 7). 74% of students responded positively to the same question, and 26% - negatively.



The methodology significantly determines the quality of teaching. It is important to determine how much academic staff can develop a student's analytical thinking, independent reasoning and analysis. In this respect for studying the position of academic personnel there are actual mechanisms for determining plagiarism in students work. 27.8% thinks that they own plagiarism identifying mechanism and always use it, 54.2% inspects it only when noticing a suspicious condition, 20.8% of the respondents does not have a mechanism for checking and cannot check it (Diagram 8). The answers of 55% of the students showed that this situation in the university is extremely difficult. Only 9% thinks that the student's works are always checked. The qualitative research finds that a mechanism for plagiarism is not officially developed at the university level, which is a significant flaw in the teaching process for this university where the ability of introducing individual approaches is significantly limited.

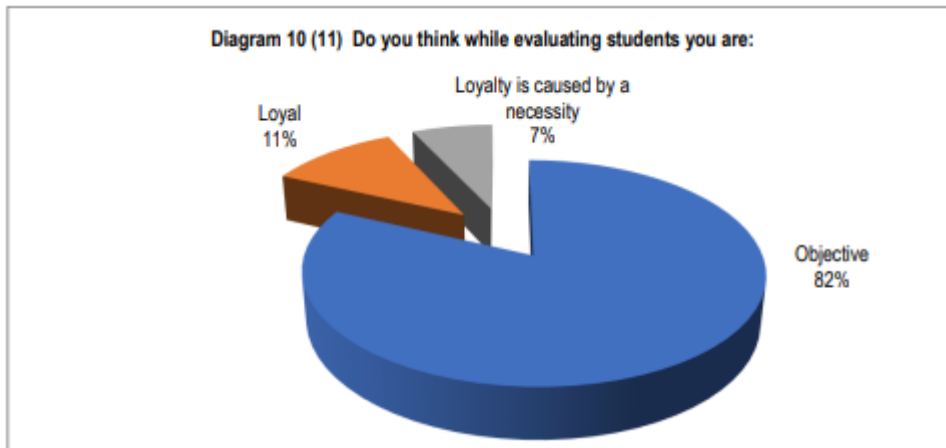


Half of the respondents report that the knowledge transferred to students by them is in compliance with practice, in this regard minor shortcomings are recognized by 25% of the lecturers; 18% considers that there are significant gaps in the field of transmitting practical knowledge; 5,6% thinks that practical knowledge cannot be transferred under existing conditions (Diagram9). 7% of the students expressed satisfaction in this direction, and 29% had a very negative attitude.

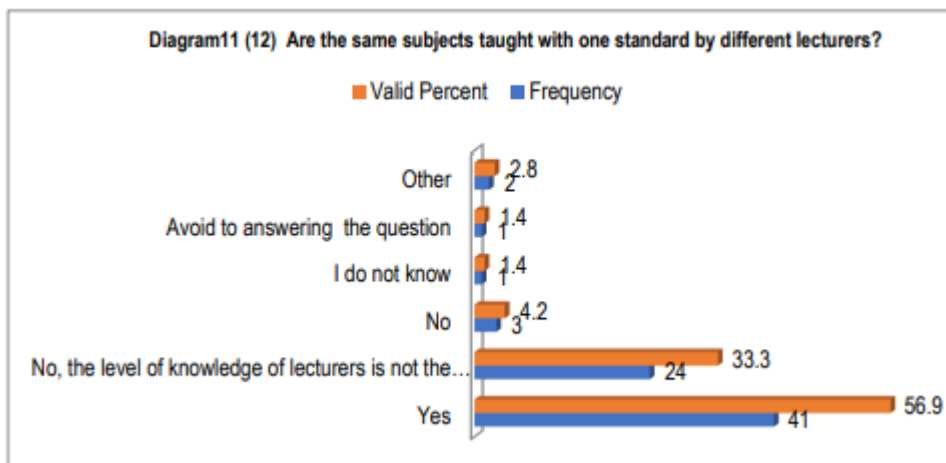


82% of the interviewed lecturers report that they are objective during assessing the students. 11% admits that they are loyal, 7% thinks that their loyalty is due to the necessity (Diagram 10). The dominant position of the lecturers is shared by 53% of the

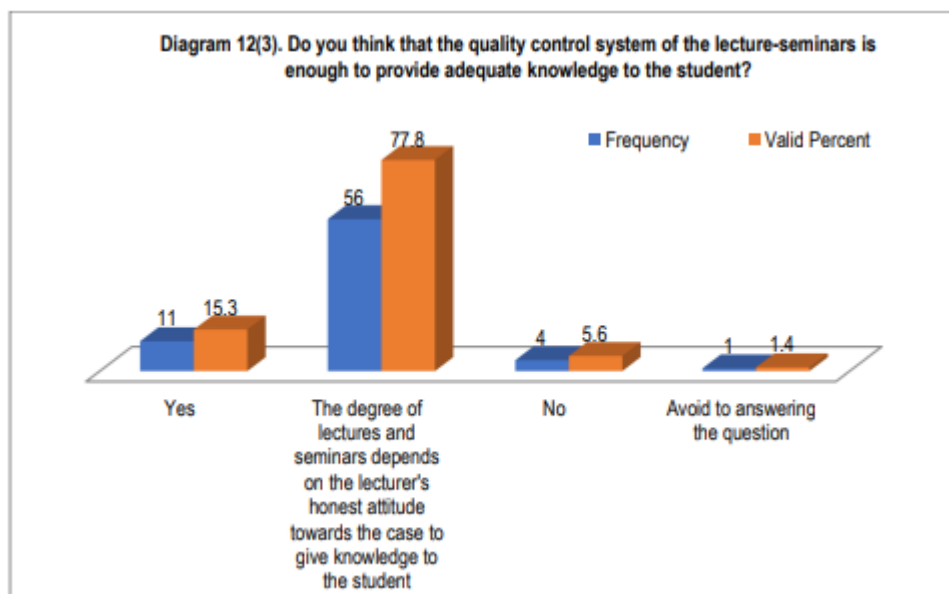
interviewed students, 43% complains about the obscurity of assessment criteria and only 3% thinks that lecturers are not objective.



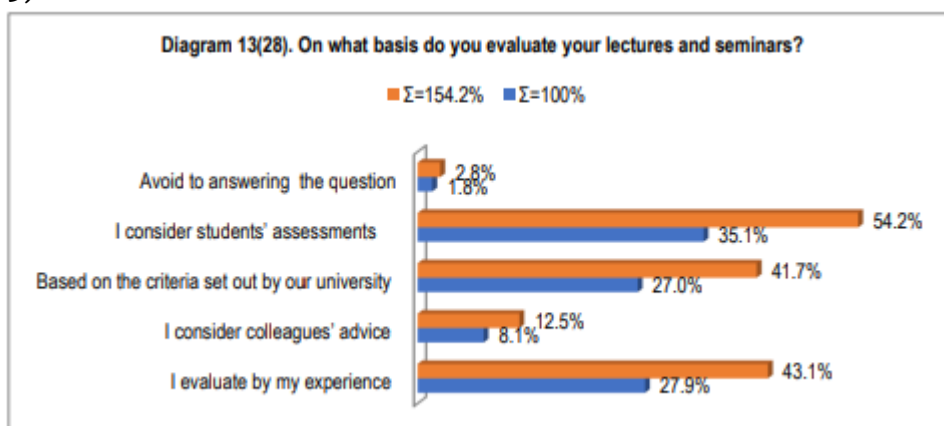
57% of the interviewed academic personnel believes that the subjects are taught in uniform standards, in total 37.5% admits that total university standards don't exist, among them 33,3% believes that the difference is due to the unequal level of the university lecturers (Diagram 11), While 24% of the students are extremely dissatisfied with the level of lecturers' knowledge, most of them (76%) are satisfied with them, thus, the answer to 21% is unquestionably positive.



78% of the lecturers recognizes that the quality of lecture-seminars depends on the conscience of professors, 5,6% of the respondents thinks that quality control system is not enough, and 15,3% positively evaluates the quality of control mechanisms (Diagram 12).



The basis for self-assessment criteria of lecturers is interesting. 54,2% of the respondents (35.1%) uses students' evaluations for their self-esteem, 43,1% (27,9%) evaluates themselves with their own experience, 41,7% (27%) - in accordance with the criteria set out in the university, 12,5% 8,1%) - considers the colleagues' opinions (Diagram 13).



Based on the analysis of the above mentioned issues, the following important issues have emerged from the challenges of teaching process management:

*The need to manage challenges for transferring global knowledge in order to enable students to obtain international and not local education, which means their competitiveness in the global work force.*

*The implementation of training programs, learning process and their ensuring mechanisms, along with many other factors, ensures efficiency of the teaching system.*

*The diploma – a document for identifying education level taken by the university graduates is important to have the authority to be a real quality indicator, which can only be the result of the implementation of multi-year, purposeful measures.*

*It is important not only to improve the programs, curriculums, syllabuses, but also to ensure its mechanisms of quality, content and realization into practice.*

*An important guarantor of the success of the graduates is the authority of the higher education institution in its turn in relation to the competitors and the perception of the authority of the university by the employers, which is achieved through long-term actions.*



The purpose of teaching process is to develop students the ability of independent, critical, creative thinking. For this it is necessary to introduce a specific teaching methodology, including not allowing plagiarism in students' analytical works, for the latter it is necessary to equip the lecturers with appropriate mechanisms.

The necessity of ensuring compliance of theoretical knowledge with practical knowledge is a major challenge for every university in any corner of the world. The particular difficulty in this respect is the teaching of professions requiring creative approaches, original thinking, the need to acquire knowledge that has no analogy, even for time and spatial distinctions; It is important to create mutually beneficial forms and platforms for cooperation of science and higher education system with business. In this way it is possible to get synergistic effects (Gulua, Ekaterine, 2015).

Strictly established standards of students' assessment system and ensuring objectivity of assessment criteria determine students' comparativeness and self-evaluation capabilities, as well as the authority of the university and the certificates issued by it.

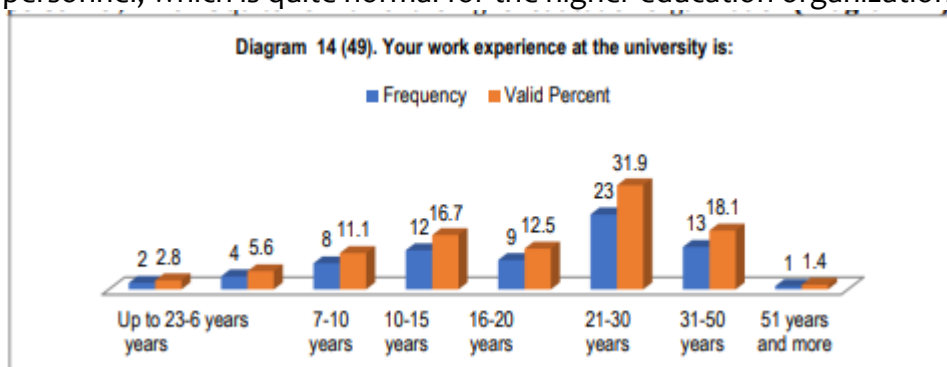
The existence of uniform standards and norms for assessing teaching and processes ensure the minimum standards of quality that will give lecturers the opportunity to evaluate the level of lectures and seminars and maintain the proper quality of the process.

The learning process is a field of service; therefore, it requires specific control mechanisms in order to ensure that quality is less dependent on the subjectivity of the lecturers and their honesty towards their job.

### Challenges of Scientific Process Management

To assess the academic process, we examined the qualifications of the academic personnel, their work experience, knowledge sharing conditions, personal and professional development opportunities; individual and team work conditions; the possibilities and conditions of establishing in an international scientific space.

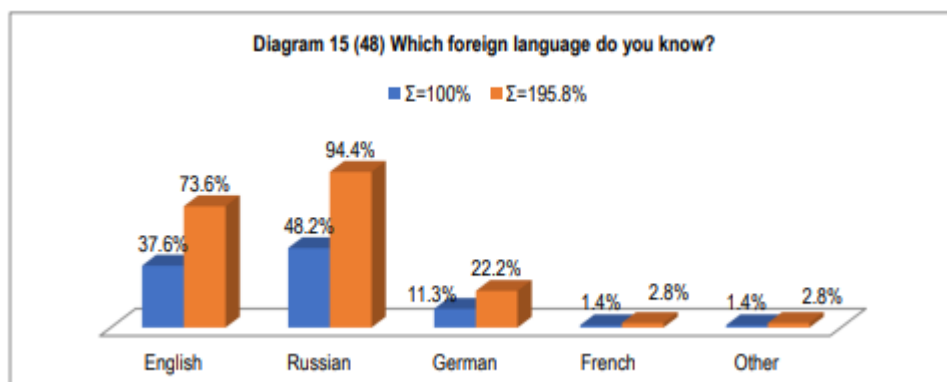
The research has found that the academic performance of the vast majority (80.5%) of the respondents exceeds 10 years, and they have academic degrees at the same time, which is a high level of teaching at the university and highlights the high level of TSU according to the international experience. We can also judge the age group of the staff. 20% is young, 20% - is of high age group, and the main part - 60% is middle age personnel, which is quite normal for the higher education organization (Diagram14).



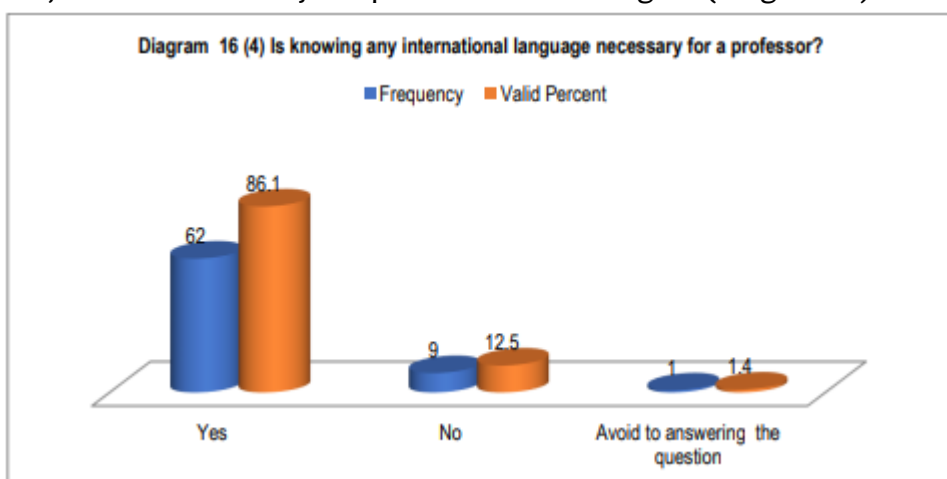
For the country whose language is not international, the necessity to know any foreign international language and to be based on foreign scientific literature is obvious for an individual and generally for scientific development.

The survey has shown the preference of three languages by the lecturers. 94% speaks the Russian language, 74% - the English language, 22% -the German language (Diagram 15).

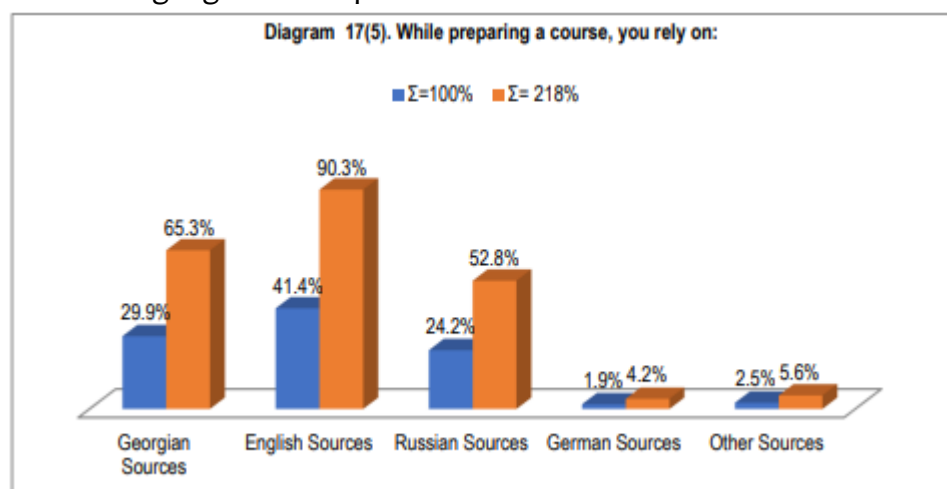




86% of the respondents think that professors must know a foreign language, and 12.5% responded negatively to this question. Since the possibility of finding literary sources in the native language is limited, naturally, we got interested in the offered subjects to students by the professors in this regard (Diagram16).

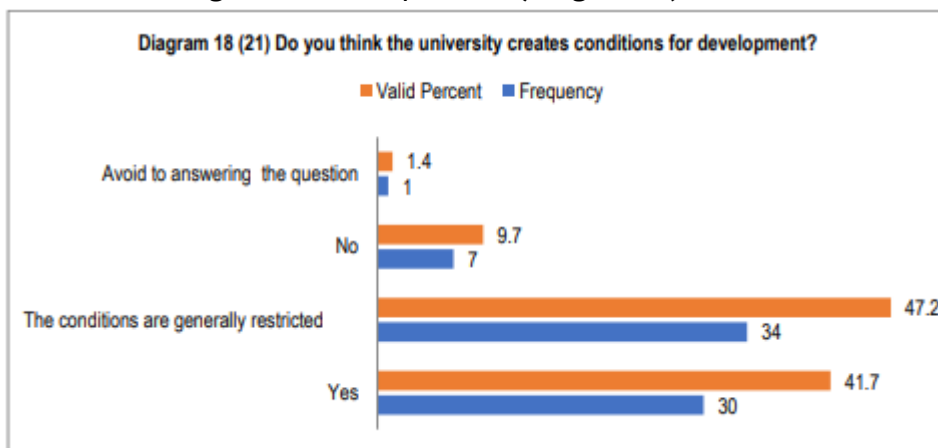


It was found that mainly English, Georgian and Russian sources are used for preparing lectures. Almost 100% of the respondents are using foreign language sources while preparing lectures (Diagram17). Particularly the use of English-language and Russian-language sources prevails.

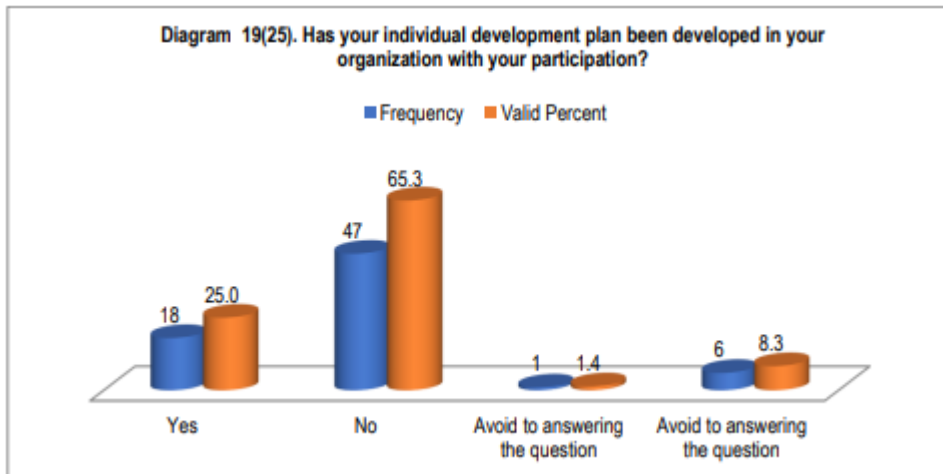


The successful functioning of higher education institutions is conditioned by the qualification of the academic staff, to care about it is the main concern of these types of

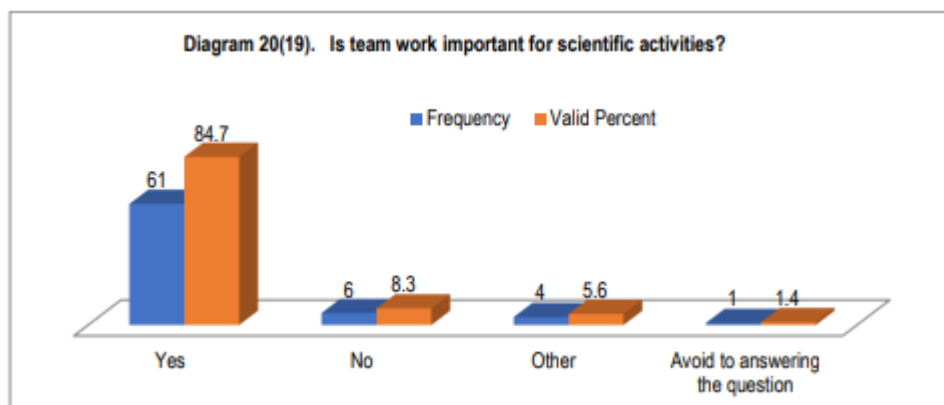
organizations. It is interesting to see how much this care is appreciated by the organization itself. 41,7% is satisfied with the support from the university to increase their qualification, 47,2% thinks that the conditions are generally limited, the answers of 9,7% are the most negative to this question (Diagram18).



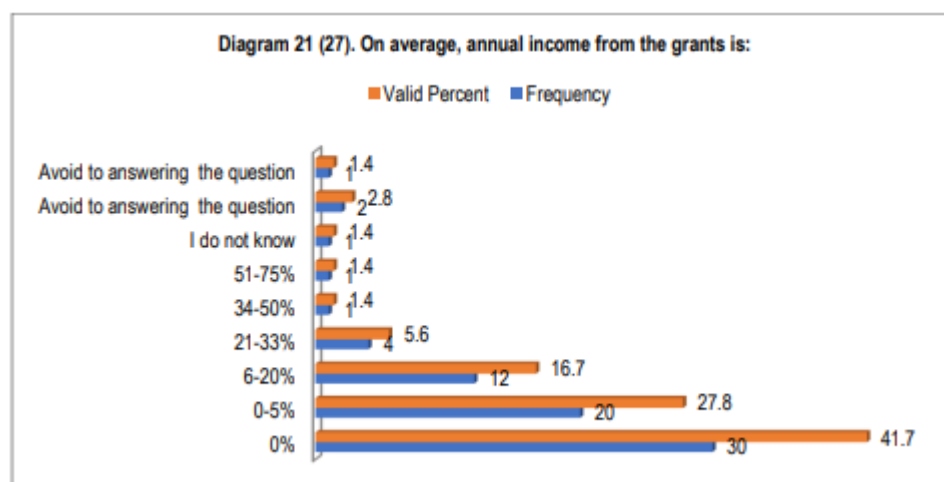
Care about personnel in modern organizations is expressed by the creating an individual development plan for the organization members and promoting its implementation. 65,3% of the respondents report that they have no such plan. The qualitative analysis also shows that the organization does not use the practice of developing such plans. Nevertheless, 25% of the respondents positively responded to this question and presumably meant the development plans of their own. One respondent has clearly stated that he/she had developed such a plan independently (Diagram19).



Scientific work in the modern environment is unimaginable without team work (Kharadze, Natalia; Gulua, Ekaterine,, 2018). The necessity of it is recognized by 84.7% of the interviewed lecturers and 8,3% believes that scientific activity is an activity that should be performed individually (Diagram20).

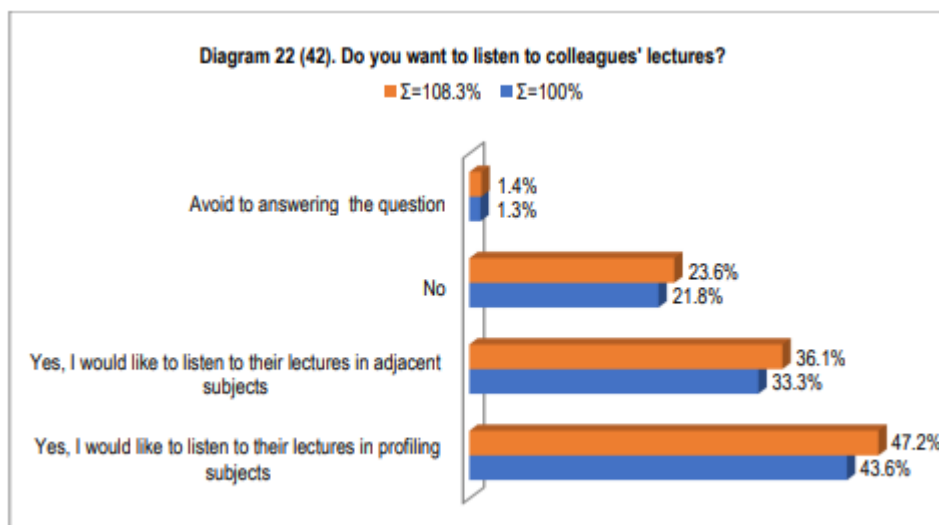


The low level of involvement in grants by academic staff indicates a lack of team work. It has been found that income from the grant is 0% for 42% of the respondents, from 0 to 5% for 28%, from 6% to 20% for 16.7 (Diagram21). The study of the students' attitudes toward the academic personnel assessment criteria, conducted by the Human Potential Management Laboratory found that 49% from 1093 students interviewed at the Faculty of Economics and Business puts the grants awarded to their lecturers from seven places in the sixth and seventh positions (Kharadze, Natalia; Gulua, Ekaterine;, 2018) This means that students do not see the link between the quality of the lecture and the grants received by the lecturer.

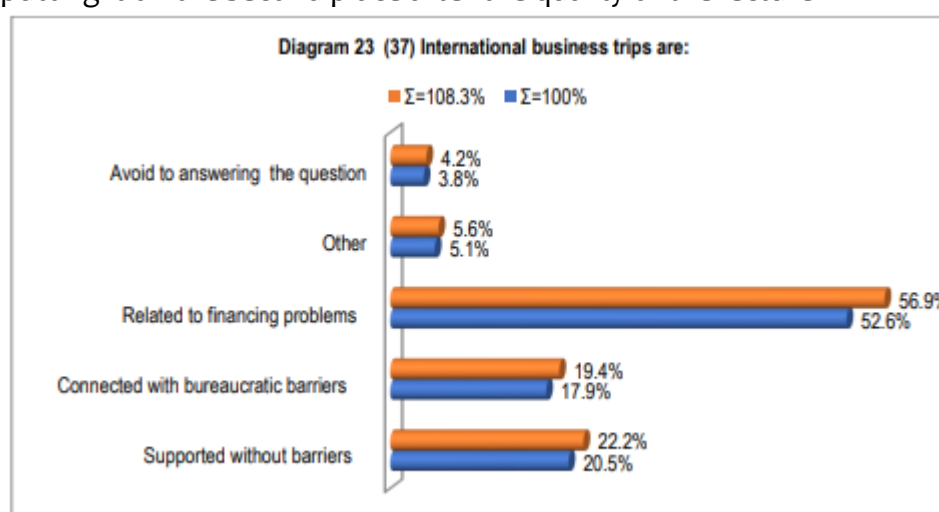


In order to reveal team work management mechanisms the respondents were asked an open question about the techniques they use with their colleagues for knowledge sharing, the contrast in responses showed that in this direction sharply formulated system does not exist, which indicates that in this direction culture management is weak (Gulua, katerine; Kharadze, Natalia, 2018), correspondingly, culture management directions are fragile (Gulua, Ekaterine; Kharadze, Natalia, 2014). From the forms of knowledge sharing conferences were reported most frequently by the respondents.

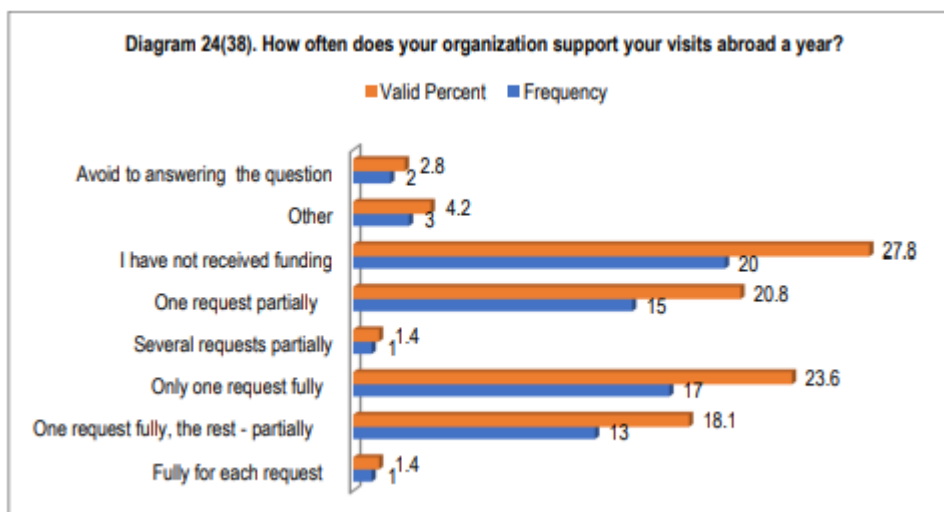
77% of the respondents expressed willingness to listen to colleagues' lectures. 43.3% of them want to listen to colleagues' lectures in profiling subjects and 33.3% - in adjacent subjects, 22% does not have the same desire (Diagram22).



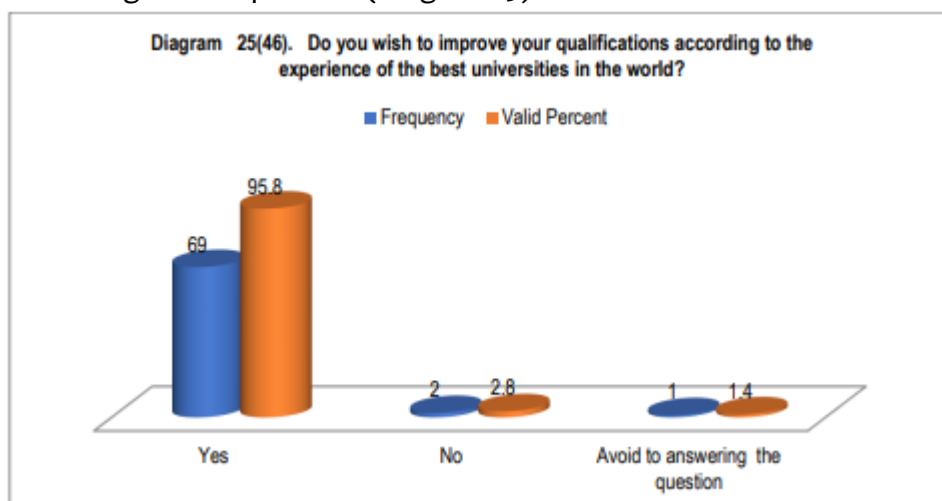
The best way to share the knowledge of scientists is to participate in international events. 22.2% of the interviewed lecturers believe that international trips are supported by the university without barriers. The main contradictions by the respondents in this regard are considered to be financial and bureaucratic problems (Diagram 23). The study of the students' attitudes (Kharadze, Natalia; Gulua, Ekaterine, 2018) towards Lecture Assessment Criteria shows that 42% of the interviewed students consider a participation in international conferences as the second and third priority while assessing lecturers and putting it on the second place after the quality of the lecture.



It is interesting to know how frequently the organization provides trips abroad for the staff. 27.8% reported that they did not receive funding for this purpose; Only one person named that each request was satisfied in full. 23.6% say that one request is satisfied fully; 20.8% reported that one visit is partially financed, and for 18.1% - one request fully, the rest partially (Diagram 24).



Absolute majority of the respondents -96% express their willingness to increase their qualifications abroad, 2 respondents have no desire of this, one refrained from answering to this question (Diagram25).



From the challenges of scientific process management the following issues have been identified:

*The level of knowledge of academic personnel depends largely on their scientific activities. Therefore, mechanisms for encouraging scientific activities should be taken into consideration with many perspectives in the management strategy of the university. Knowing international languages by scientific and academic personnel plays a crucial role in the gaining and transferring modern knowledge and in the science development. It is therefore important to promote international language teaching at all levels of education system.*

*Establishment of assessment criteria for scientific and academic personnel and to promote the awareness and authority of the scientists ("branding"), based on a publicity of personal data, promoting engagement in public activities will result in improving the image of university and professors, as well as increasing scientists' objective self-esteem and improving students' attitudes towards studying.*

*Several months are not enough to increase the qualification of scientists. This needs years – it is a result of long-term labor. The maximum return of scientists starts at the age of 45-50. Considering this fact, attention should be paid to making the best young people interested*

in these challenging activity, the healthy change of generations, the maintenance of experienced scientists; the reasonable replacement of auditory and scientific work. With the growth of a scholar's age and qualification the qualification of a listener must be developed and the number of listeners should be reduced.

Taking into consideration the abovementioned and also individual personal interests and talents individual development plans for scientists should be made by the involvement of the special department of Human Resources Management. The organization is obliged to observe and support their implementation.

Scientific groups are the most successful in creating scientific products in the modern world. Individual scientific activity rarely gives a result compared to team work. Therefore, it is important to encourage group work by using different effective mechanisms against stimulating internal competition. Professional and personal self-esteem is naturally an internal competition nutrient.

International and local scientific grants are effective for the development of science, as well as for the growth of scholarship and university revenue. That is why scholars who gain international grants in this direction achieve success in this direction, especially those who can involve their own colleagues and young generation representatives in such projects, are necessary to be adequately encouraged.

Introduction of knowledge sharing mechanisms is important for the development of science and raising scientists' qualifications. The ability to attend colleagues' lectures is a good way to share knowledge.

The opportunity to attend international events for scientists allows Georgia to establish a certain image in the international scientific society. It is important for the university to have a specific policy in this direction. The main thing here is to take care of the quality and not quantitative improvement of the condition, which will increase the efficiency of costs.

The desire to increase the qualification of scientists is important to be followed by the appropriate realistic support. In this regard, it is important to use internal reserves fully and buy external services on the basis of analyzing the expediency of expenditures.

Preliminary hypotheses have been verified by statistical methods. In particular, we used Pearson correlation analysis of pyroson, the Chi-squared tests to substantiate the reliability of the connections between the variables and linear regression, namely the ANOVA test.

H1: Variable – Q1 (Do you give your students international level knowledge in your subject?) affects the variables:

Q4 (Is knowing any international language necessary for a professor?).

Q19 (Is team work important for scientific activities?).

H2: Variable Q9 (Does your university diploma have a high authority among employers?) affects the variables:

Q2 (Does the University Teaching System Meet the Standards of Higher Education System?).

Q12 (Are the same subjects taught with one standard by different lecturers?).

H3: Variable Q21 (Do you think the university creates conditions for development?) affects the variables:

Q19 (Is team work important for scientific activities?);

Q25 (Has your individual development plan been developed in your organization with your participation?);

Q38 (How often does your organization support your visits abroad a year?).



H1 Hypothesis. To prove H1 hypothesis we have made Pearson Correlation Analysis Test. By the test the correlation between variables Q1 and Q14, Q19 has been confirmed. The link between Q1 and Q14 is very strong (it almost equals to one). The link between Q1 and Q19 is weak (In the range between -0,5 and 0,5) (see Table 1).

Table 1. Pearson Correlation Analysis

		Q1	Q4	Q19
Q1	Pearson Correlation	1	.997**	.414**
	Sig. (2-tailed)		.000	.000
	N	72	72	72
Q4	Pearson Correlation	.997**	1	.419**
	Sig. (2-tailed)	.000		.000
	N	72	72	72
Q19	Pearson Correlation	.414**	.419**	1
	Sig. (2-tailed)	.000	.000	
	N	72	72	72

\*\* Correlation is significant at the 0.01 level (2-tailed).

The Chi-squared test has shown that the connection between these variables: Q4 and Q1, Q4 and Q19 are reliable. In both cases sigma is less than 0,005 (see Table 2, 3).

Table 2. Chi-Square Tests (Q4* Q1)				Table 3. Chi-Square Tests (Q4* Q19)			
	Value	df	Asymp. Sig. (2-sided)		Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	72.598 <sup>a</sup>	6	.000	Pearson Chi-Square	18.842 <sup>a</sup>	6	.004
Likelihood Ratio	11.403	6	.077	Likelihood Ratio	8.979	6	.175
Linear-by-Linear Association	70.599	1	.000	Linear-by-Linear Association	12.484	1	.000
N of Valid Cases	72			N of Valid Cases	72		
a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .01.				a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .01.			

According to linear regression analysis, R Square coefficient shows that Evaluation of the indicators is very close to real; It Almost equals to one. (see Table 4).

Table 4. Model Summary by linear regression analysis				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.997a	.994	.994	.878
a. Predictors: (Constant), Q19, Q4				

By the linear regression analysis, the ANOVA test has shown that the model is reliable, because the sigma is less than 0,005 (see Table 25 (H2)). Between Q4 and Q19 the more important is Q19.

Table 5. Linear regression (ANOVAa)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9387.301	2	4693.651	6094.161	.000b
	Residual	53.143	69	.770		
	Total	9440.444	71			

a. Dependent Variable: Q1

b. Predictors: (Constant), Q19, Q4

H2 Hypothesis. By Pearson Correlation Analysis Test the correlation between Q1 Q14 Q19 variables has been confirmed. It was turned out that the link between Q10 and Q2, Q2 and Q12 is very weak and weak; the link between Q10 and Q12 is medium (In the range between -0,7 and 0,7) (Table 6).

Table 6. Pearson Correlation Analysis

		Q10	Q2	Q12
Q10	Pearson Correlation	1	.157	.537**
	Sig. (2-tailed)		.189	.000
	N	72	72	72
Q2	Pearson Correlation	.157	1	.224
	Sig. (2-tailed)	.189		.058
	N	72	72	72
Q12	Pearson Correlation	.537**	.224	1
	Sig. (2-tailed)	.000	.058	
	N	72	72	72

\*\*. Correlation is significant at the 0.01 level (2-tailed).

The Chi-squared test has shown that the connection between the variables: Q10 and Q12 is reliable. The sigma is less than 0,005 (see Table 7).

Table 7. Chi-Square Tests (Q10\* Q12)

	Value	df	Asymp. Sig. (2-sided)
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Pearson Chi-Square	53.669a	20	.000
Likelihood Ratio	26.611	20	.147
Linear-by-Linear Association	20.464	1	.000
N of Valid Cases	72		

a. 25 cells (83.3%) have expected count less than 5. The minimum expected count is .01. By the linear regression analysis, the ANOVA test has shown that the model (Q10 Q2 Q12) is reliable, because the sigma is less than 0,005 (see Table 8).

Table 8. Linear regression (ANOVAa)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2716.667	2	1358.333	14.064	.000b
	Residual	6663.945	69	96.579		
	Total	9380.611	71			

a. Dependent Variable: Q10

b. Predictors: (Constant), Q12, Q2

H3 Hypothesis. The existence of correlation between Q21, Q19, Q25, Q38 variables has been confirmed by the Pearson Correlation Analysis Test. However, the connection between these variables was weak (In the range between -0,5 and 0.5) (see Table 9).

Table 9. Pearson Correlation Analysis

Correlations		Q21	Q19	Q25	Q38
Q21	Pearson Correlation	1	.490**	.362**	.407**
	Sig. (2-tailed)		.000	.002	.000
	N	72	72	72	72
Q19	Pearson Correlation	.490**	1	.117	.376**
	Sig. (2-tailed)	.000		.328	.001
	N	72	72	72	72
Q25	Pearson Correlation	.362**	.117	1	.263*
	Sig. (2-tailed)	.002	.328		.025
	N	72	72	72	72
Q38	Pearson Correlation	.407**	.376**	.263*	1
	Sig. (2-tailed)	.000	.001	.025	
	N	72	72	72	72

\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

The Chi-squared test has shown that the connections between the variables: Q21 and Q19, Q25, Q38 are reliable. The sigma in each case is less than 0,005 (see Table 10, 11, 12).

Table 10. Chi-Square Tests (Q21\*Q19)

	Value	df	Asymp.

Table 11. Chi-Square Tests (Q21\*Q25)

	Value	df	Asymp.

			Sig. (2-sided)				Sig. (2-sided)
Pearson Chi-Square	79.186a	9	.000	Pearson Chi-Square	30.555	9	.000
Likelihood Ratio	19.526	9	.021	Likelihood Ratio	20.678	9	.014
Linear-by-Linear	17.039	1	.000	Linear-by-Linear	9.328	1	.002
Association				Association			
N of Valid Cases	72			N of Valid Cases	72		
a. 13 cells (81.3%) have expected count less than 5. The minimum expected count is .01.				a. 12 cells (75.0%) have expected count less than 5. The minimum expected count is .01.			

Table 12. Chi-Square Tests  
Q21\*Q38

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	42.624a	21	.004
Likelihood Ratio	27.744	21	.148
Linear-by-Linear	11.736	1	.001
Association			
N of Valid Cases	72		

a. 24 cells (75.0%) have expected count less than 5. The minimum expected count is .01. By the linear regression analysis, the ANOVA test has shown that the model (Q21 – Q19, Q25, Q38) is reliable, because the sigma is less than 0,005 (see Table 13).

Table 13. Linear regression (ANOVAa)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3409.407	3	1136.469	12.965	.000b
	Residual	5960.537	68	87.655		
	Total	9369.944	71			

a. Dependent Variable: Q21

b. Predictors: (Constant), Q38, Q25, Q19

Thus, the listed hypotheses have been proved.

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