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ACADEMIC PERFORMANCE OF TEACHING AND RESEARCH STAFF IN AGRICULTURAL HIGHER EDUCATION OF MOLDOVA

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Abstract

Moldova traditionally relies on the agricultural sector, rural population representing one third of labor force. The agricultural education and research system in Moldova is characterized by the aging of the teaching and research staff, the reduction of the number of students below the critical level, unattractiveness of science and education for the young generation, the weak connection between education, science and production, but also the inefficiency of the institutional activity. All these represent a major danger for the sustainable development of the rural areas. The aim of this paper is to analyze the major factors affecting the academic performance of research and teaching staff in agricultural higher education of Moldova. The study is based on field surveys of academic personnel of State Agricultural University, the only agricultural higher education institution in Moldova. The data set includes 120 respondents. Main analyzed indicators are related to academic performance as: professional motivation, research activity in projects, published research results and achievements, main problems and challenges within the institution related and other relevant factors. As result, income level remains an important factor for staff motivation in achieving higher performance.

Key words**:** *agriculture, academic performance, higher education, university, research*

INTRODUCTION

Management, measurement and assessment of performance related to public sector is a well-known tool used by most countries governments. Performance management is recommended as a way to develop employees. Aguinis [1] define performance management as "identifying, measuring and developing the performance at individuals or teams level integrated within the organization main aims" [1]. Thus, we can find a linkage between performance management and human resources development [2].

Performance management and performance measurements are closely related. In order to achieve performance management is important to select the main factors and the performance indicators for a quantitative assessment [3, 5].

The university sector was also affected by different changes related to the reduction of available financial resources, increased competition, change in the number of students [4]. Assessment of performance indicators in universities became particularly important for an efficient managerial system. It is believed that performance indicators have a major role in the management of higher education institutions [7]. Some authors examine the satisfaction level of staff with the existing performance indicators and provide recommendations towards improving its application [7], while others consider that the emphasis should be directed towards its effectiveness and efficiency [3]. In some cases, performance systems in higher education institutions do not measure the entire academic process: input, output and outcome [4].

To assess performance more quantitative performance measures are used, but they create different effects [8]. According to Taylor [7], performance indicators should be divided into three categories: internal, external, and operating.

The Republic of Moldova is the country with the highest share of the rural population in Eastern Europe. Despite this fact, the unemployment rate in villages is almost two thirds of the population. Due to the decrease of the employment possibilities in the rural

environment, a massive process of depopulation of the villages takes place, especially by the young people and those with studies. On the other hand, the research-innovation system, which must be a pillar of support for agricultural producers, is also facing major problems and is not fulfilling its task. The precarious conditions in which the education-research system in agriculture faces with, characterized by the aging of the academic staff, the reduction of the number of students below the critical level, unattractiveness of science and education for the young generation, the weak connection between education, science, and production, but also the inefficiency of the institutional activity represents a major danger for the sustainable development of the rural areas.

The main areas to set priority objectives related to research, education and innovation in agricultural higher education institution of Moldova are: "physical and financial resources, performance management and development, performance attitude of teaching and research staff, innovation and social responsibility" [6].

The aim of this paper is to analyze the major factors affecting the academic and research performance of human resources in agricultural higher education of Moldova.

MATERIALS AND METHODS

The study is based on field surveys of academic personal in State Agricultural University of Moldova, the only agricultural higher education institution in Moldova. The data set includes 120 respondents. The survey was realized in May- June 2021. Main analyzed indicators are related to academic performance as: professional motivation, participation in research projects, published research results, collaboration with third organizations, main problems and challenges within the institution related and other relevant factors.

The data collected through questionnaires involved academic staff from State Agricultural University of Moldova. The surveyed staff included people from 29 to 80 years old (45 years on average), with an average work experience in education and research of 23 years (Table 1). The analyzed sample includes different target groups differentiated by age, work experience, scientific degree and position. In order, to determine which factors have a greater influence, regression analysis was used. Results analysis was made through SPSS Statistics software.

Table 1. Sample structure

Variable	Category	Number of respondents	Percentage
Age	<35	16	13.33
	36-45	54	45.00
	46-60	36	30.00
	>61	14	11.67
Work experience	>10	12	10.00
	11-20	38	31.67
	21-30	48	40.00
	31-40	8	6.67
	>40	14	11.67
Scientific degree	without scientific title	28	23.33
	Ph. D	74	61.67
	Ph. D habilitate	18	15.00
Job position	assistant	32	26.67
	lecturer	8	6.67
	associate professor	64	53.33
	professor	16	13.33

Source: author's field research.

This research was realized within State Project 20.8009.0807.44 "Adaptation of the agricultural education-research system in the Republic of Moldova to the conditions of the contemporary society".

RESULTS AND DISCUSSIONS

The number of employed people in agriculture has been diminishing considerably over the last two decades (from 50% in 2000 to 36% in 2018). Nowadays in agriculture are employed about 20 percent of active population. Also, the structure of employed people in agriculture according to education level had changed (Figure 1).

The number of employed persons in agriculture with a higher education degree increased with 5 percent in 2020 comparing to 2014 level (from 231.6 thousand persons to 236.1). At the same time increased insignificantly the number of secondary specialized persons employed in agriculture.

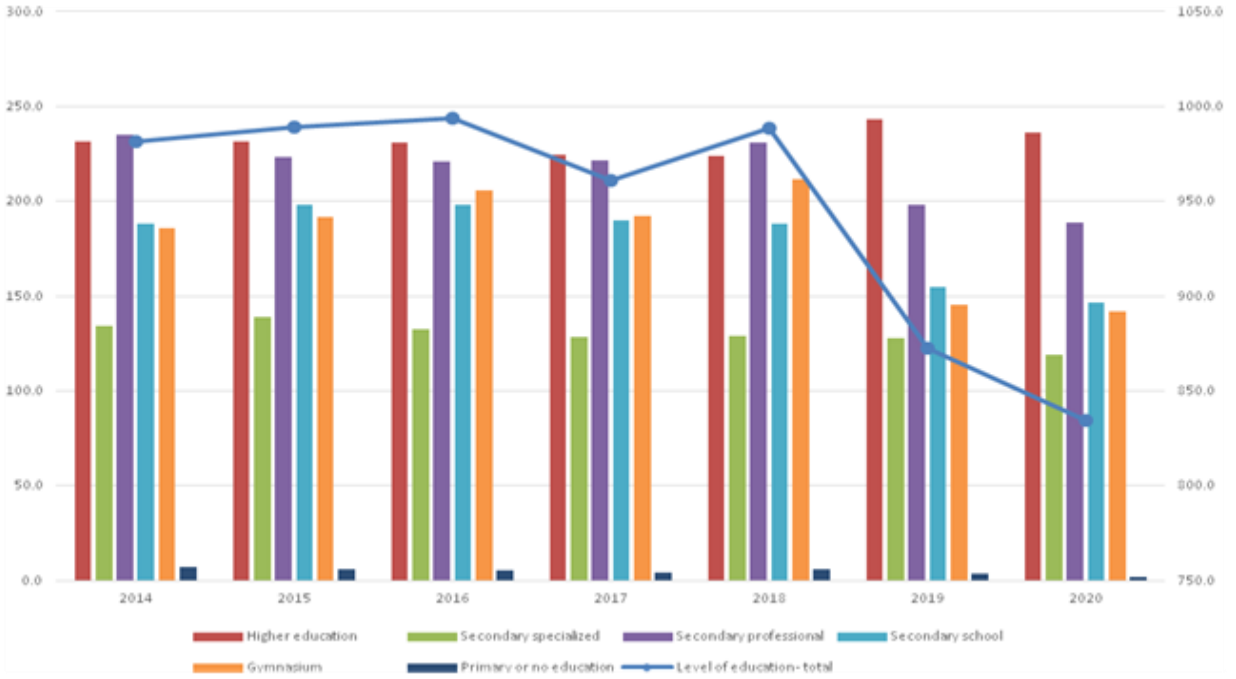

Fig. 1. Population employed in agriculture according to the level of education
Source: based on data from National Bureau of Statistics.

A reduction is noticed in relation to those that have a secondary professional, secondary school, gymnasium and primary or no education level (Figure 1).

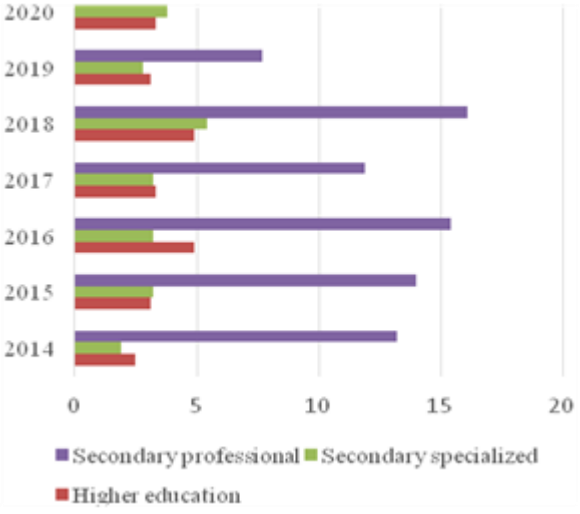

Fig. 2. Employed young population (until 35 years old) in agriculture according to the level of education
Source: based on data from National Bureau of Statistics.

If analyzing the employment in agriculture among young population until 35 years old, an opposite tendency is observed (Figure 2). Most persons have secondary professional level of education, followed by higher education or secondary specialized level.

The State Agricultural University if the only higher education institution and offers different degree programs at both bachelor and master level, as well as doctoral studies in the area of agricultural sciences in Moldova. The university includes six faculties with 3941 students and employs 296 teaching and research staff (according to 2019 data).

The university's academic staff includes 40 percent of people within 31- 45 y.o, 32 percent aged 46 – 62 and 29 precents of staff at retired age (>63 y.o.). Ageing staff is one of the main challenges for further development of the university and its performance management. Among the employed teaching and research staff, 70 percent have a Ph. D/Ph. D habilitate title, 44 percent are

associate professors and 9 percent are professors (Table 2).

Table 2. The teaching and research staff in State Agricultural University, 2019

Faculties	staff number	Age, years			
		< 30	>=31< 45	>=46< 62	>63
Economy	78	1	47	23	9
Agronomy	56	2	20	17	19
Horticulture	39	0	11	19	11
Veterinary Medicine	40	2	11	13	14
Agricultural Engineering and Transport	44	0	16	11	17
Cadastre and Law	39	2	11	10	16
Total	296	7	116	93	86

Source: based on institutional data.

Staff performance is closely related to motivational factors that would allow academic staff to obtain better results. Among motivational factors we could refer to monetary and non-monetary factors. Among monetary factors, wage level represents an important incentive for all activities. Nevertheless, there are factors apart from financial ones, that can provide an equal or strong enough motivation for achieving high performance. These could be considered the following: recognition of scientific results, promotion possibilities, flexibility of working schedule, appreciation from colleagues.

From obtained data according to surveyed staff, recognition of scientific results, followed by career promotion possibilities and schedule flexibility are the factors that most motivates their activity (Figure 3).

Fewer surveyed academic stuff answered that wage size and appreciation are important factors that motivates their professional activity.

According to regression analysis data, there is a stronger correlation between respondents age (R=0.32) and work experience (R=0.37) with main factors that motivates the teaching and scientific activity. Results indicates that university's academic staff job position (R=0.29) and scientific degree (R=0.25) does not impact considerably the factors that determine academic staff to involve in teaching and research activity.

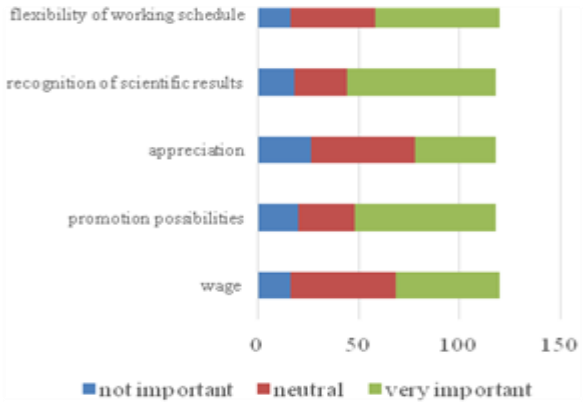

Fig. 3. Factors that motivate the teaching and scientific activity of academic staff
Source: based on survey data.

An important factor that affects the scientific performance of academic staff is related with the number of teaching hours per year. According to university's internal regulation (based on Ministry of Education, Culture and Research framework) yearly an associate professor teaching activity consists of 300-400 hours per academic year, for a professor 200-300 hours, while those that have a position of assistant or lecturer – between 400 and 600 academic hours. One third of surveyed teaching staff consider that teaching activity should consist of about 200-300 hours during an academic year in order to ensure quality in both teaching and research activities (Table 3).

Table 3. Desired number of teaching hours per academic year to allow ensuring quality

Number of hours per year	Number of respondents	Percentage
<100 hours	22	18.33
100-200 hours	32	26.67
201-300 hours	38	31.67
301-400 hours	26	21.67
>400 hours	2	1.67

Source: based on survey data.

At the same time, 34 percent would prefer to teach less than 100 hours or maximum 200

hours during an academic year in order to ensure high quality and to be able to carry on research activities. Only 21 percent believe that teaching 300-400 hours a year would allow them to accomplish all teaching and research tasks at a high level. The amount of teaching hours has an impact on research performance of academic staff. University staff that must teach more academic hours or a greater number of courses during a year have less time for scientific activities as working in research projects. According to multiple regression results, the number of teaching hours correlate with the activity in research projects (R=0.38) and number of scientific and methodical papers written (R=0.35). On average, the surveyed respondents taught 5.4 courses during the academic year 2020-2021. The range of courses varied from 2 to 14 courses. Job position influence the number of courses taught, thus a professor will have a lower number of courses, while an assistant professor or lecturer will have to take more courses to fulfill the minimum compulsory teaching hours per year. Multiple regression results reveals that there is an average correlation (R=0.47) between the number of courses taught during an academic year and the published scientific and teaching results (as research papers and various teaching/learning materials).

Table 4. Activity in research projects and other projects during 2016-2021

	Research projects	%	Other projects	%
Member of national project team	64	53.33	46	38.33
Member of international project team	38	31.67	34	28.33
Manager of national projects	14	11.67	12	10
Manager of international projects	14	11.67	2	1.67

Source: based on survey data.

More than half of surveyed academic staff worked within national research projects as a member, while one third were engaged in international research projects. Only 11 percent acted as managers of a research project (project manager/director) in the case of both national and international research projects (Table 4).

Meanwhile, university teaching and research staff participated also in other projects rather than scientific ones. A higher number of staff were involved as member of national project team (38 percent), and one forth of staff participated as team members of international projects. From regression data analysis the staff involvement in projects participation does not depend on personnel age, but there is a moderate association with work experience (R=0.44), scientific degree of researchers (R=0.45) and job position (R=0.43).

Most of university research staff participated in projects with the purpose to obtain academic experience (53%), make new contacts and enlarge the collaboration with peers from other countries (53%) or to obtain additional income (51%). Also, important reasons that determine university staff to participate in research projects are related to elaboration of research papers in peer reviewed and impact factor journals, conference participation, passion for research activity and the possibility to contribute to the development of the national agri-food sector (Table 5).

Among surveyed university staff, many answered that elaboration of doctoral thesis and support of Ph.D students were not important factors that determine their motivation to work in research projects. Such answers are related to the fact that most of surveyed staff already hold a Ph.D or Ph. D habilitate, thus this factor does not represent an incentive for their work in research projects. During the last five years, 16 of surveyed staff had confirmed the scientific degree of Ph.D/Ph.D habilitate, while 40 confirmed the title of associate professor/professor. However, only 25 percent of surveyed teaching and research staff have the right to supervise doctoral students, thus the reason to support Ph D students is not a relevant reason for project participation.

Regression analysis results demonstrate there is a strong correlation between the surveyed staff's scientific degree (R=0.71) and job

position (R=0.67) with main determinant factors that influence participation in national and international projects. Meanwhile, researchers age and experience present an average correlation (R=0.48 and R=0.51).
An important part of research activity for all university's teaching and research staff is the elaboration of scientific papers and teaching materials.

Table 5. Determinant factors that influence university teaching and research staff participation in national and international projects, %

	not important	average	very important
Elaboration of Ph. D/ Ph. D. habilitate thesis	61.6	20.0	16.6
Willingness to get an additional income	21.6	26.6	51.6
PhD students' support	53.3	21.6	25.0
Elaboration and editing of scientific articles in journals with impact factor	30.0	26.6	43.3
Participation in scientific conferences abroad	31.6	31.6	40.0
Gaining academic experience	23.3	15.0	53.3
Obtaining new contacts and/or collaborating with researchers from abroad	21.6	25.0	53.3
Possibility to contribute to the development of the agri-food sector of the country	25.0	35.0	38.3
Visiting touristic objects in the country or abroad	43.3	26.6	26.6
Passion for research, science	26.7	25.0	48.3

Source: based on survey data.

During 2016-2021 were published scientific papers in national journals and conference proceedings 9 on average per surveyed person, followed by published scientific papers in international journals and conference proceedings – 4.43, university courses, including courses placed on educational platforms – 4.18 and methodical guidelines for taught courses - 3.6 (Figure 4).
There is a strong correlation between the job position and the number of published research papers and other teaching materials (R=0.63). Due to the fact that each university job position is for five years, in order to be eligible to apply for same or different teaching and/or research position a number of conditions should be met. Among these the number of published scientific research papers, textbooks are most important.

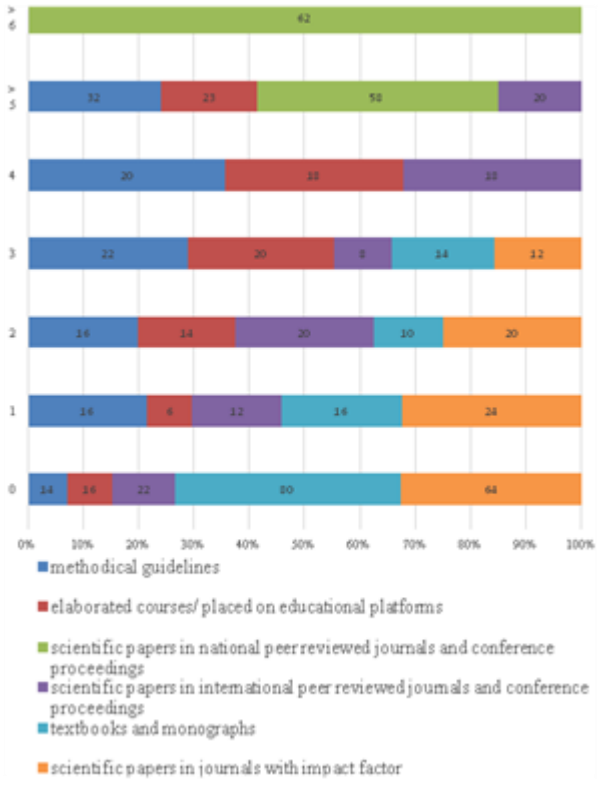

Fig. 4. Elaborated scientific papers and teaching materials by State Agricultural University staff during 2016-2021
Source: based on survey data.

Unfortunately, the yearly number of teaching hours per academic staff is quite high, thus most of surveyed staff would prefer fewer hours (until 300). Thus, in order to achieve the individual research objectives established for the academic year, some staff must work additional hours from home or during weekend (Figure 5).

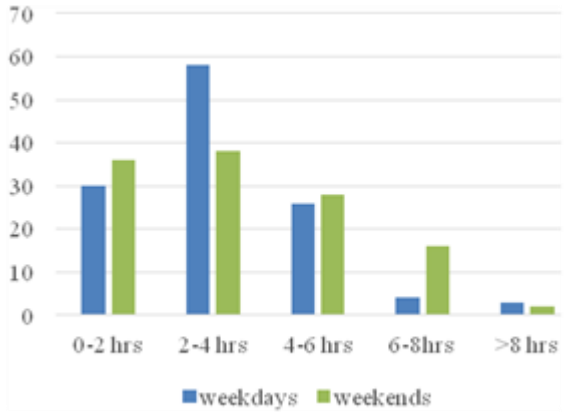

Fig. 5. Additional time spent on teaching and research activities
Source: based on survey data.

From received data, 25 percent dedicates between 0 and 2 hours within the working week to their scientific and teaching activity from home, while 48 percent allocate from 2 to 4 hours for these activities. At the same time, one third of surveyed staff allocated from 0-2 hours for the scientific and teaching activities during weekends, while another third spends from 2 to 4 hours (Figure 5).

Income is an important factor for staff motivation and a greater performance. Unfortunately, the monthly income received by surveyed teaching and research staff remains at a low level (7,906 MDL on average, with variations from 6,000 to 16,000 MDL), with an average family monthly income of 13,100 MDL. The survey suggests that most of respondents consider the monthly wage low that is not sufficient to cover expenses for a decent living. According to survey results, respondents consider that an minimum amount of 21,333 MDL per month (on average per surveyed staff) is necessary to insure normal living conditions for academic staff. The relevance of income factor is demonstrated by the average strong correlation with staff motivation for academic and scientific work (R=0.54), participation in research projects (R=0.52), publication of research papers and teaching materials (R=0.45).

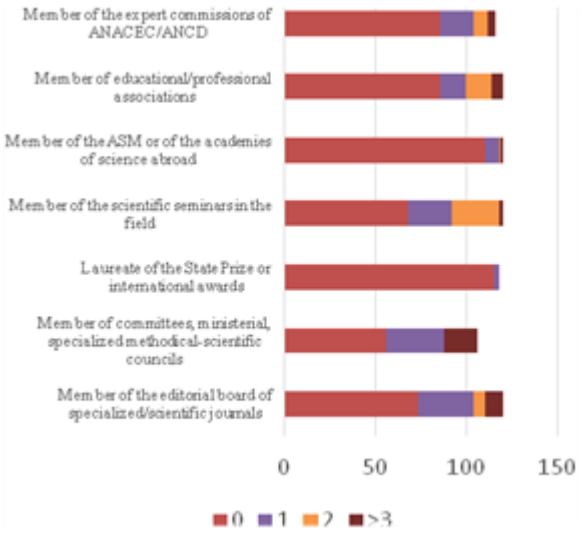

Fig. 6. Academic performance achievements 2016-2021
Source: based on survey data

Beside project participations and published papers, an important indicator of performance for teaching and research staff are different professional achievements. Among these professional achievements are included the following: member of expert commissions of National Agency for Quality Assurance in Education and Research and/or National Agency for Development and Research; Member of Science Academy of Moldova and/or other academies abroad; member of different educational/professional associations; member of scientific seminars in the field of research; laureate of the state prize and/or other international awards; member of committees, ministerial, specialized methodical-scientific councils; member of scientific journals editorial board (Figure 6).

The income size has a significant impact on the results of academic performance as member of scientific journals, editorial boards, participation in governmental, ministry commissions or scientific councils, member of scientific seminars and professional associations, member of expert commissions (R=0.5).

Satisfaction level from teaching and research conditions in the State Agricultural University reveals that only one quarter of employees are satisfied, while no one answered to be very satisfied (Figure 7).

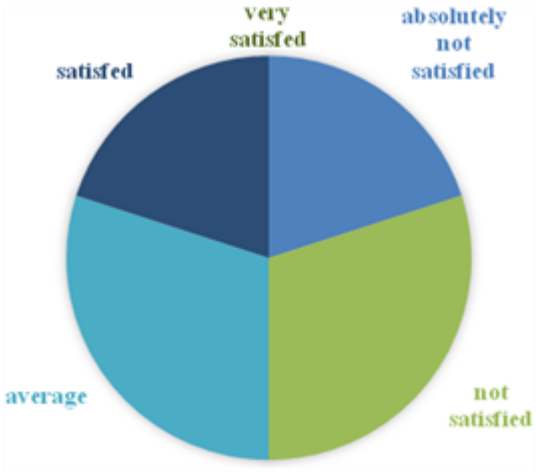

Fig. 7. Satisfaction level from educational and research conditions in the institution
Source: based on survey data

A direct factor which affects the satisfaction levels is the wage size. There is positive correlation between staff wage level and satisfaction ($R=0.42$, $p<0.05$). Moreover, half of surveyed staff affirm that the financial situation of their family over the last five years worsened, while one third consider the option to leave the country and move abroad. Most indicated the low wage as a main reason that determines to leave the country ($R=0.41$).

CONCLUSIONS

The performance of academic staff in State Agrarian University of Moldova depends on appreciation from peers and colleagues, wage level and flexibility of working hours. The number of teaching hours per year have a great impact on academic staff research activity. Most of surveyed staff participated in national or international research projects during the last five years. There is a moderate correlation between work experience, scientific degree and job position with the participation in research projects. Main motivation to engage in research projects is associated with obtaining academic experience, expanding collaboration with other colleagues from abroad, and obtaining additional income.

Income level remains an important factor for staff motivation in achieving higher performance. According to survey data its low level is not sufficient to cover monthly expenses of academic staff and determines the overall level of satisfaction. Moreover, low wage level is main factor that motivates academic staff to migrate abroad in the search of new opportunities.

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