



Analysis of the Correlation between Academic Staff in Universities in Constanța and the Average Monthly Labor Cost in Tertiary Education

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ABSTRACT

This paper aims to highlight the relationship between the number of individuals working as academic personal in higher education in Constanța County and the average monthly employment cost per employee in the educational system over a twelve-year period. Using the database published online by the National Institute of Statistics, it will be concluded whether there is a dependency relationship between the two variables, with the help of a simple linear regression statistical-econometric model.

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1. Introduction

At the moment, the teaching career is at a professional impasse, characterized by an increasingly precarious and difficult balance between the benefits and disadvantages of this profession. On the one hand, there is the satisfaction of fulfilling the vocation of being a teacher, the social status gained, the remuneration and job stability, the joy of contributing to the development of young people and society, the opportunity to stay in constant contact with the new generation, and more. On the other hand, the disadvantages include the instability of the educational curriculum, student behavior, especially in terms of indiscipline, aggression, lack of motivation to acquire knowledge, and apathy due to the absence of job market prospects. Added to this are the stress and emotional exhaustion experienced by teachers, the heavy workload, and so on. The aim of this paper is to provide a numerical overview of the university environment in Constanța County, reflecting that the balance of advantages versus disadvantages is unstable and that measures should be taken in this regard.

2. Literature review

Financial and non-financial factors no longer hold the same value for the teaching profession in Romania, according to a study conducted by Lisievi P. and others (2013), which included students from the undergraduate education science program at Spiru Haret University. The study concluded that inadequate salaries, lack of respect from society and students, as well as the heavy workload both in teaching and bureaucratic tasks, lead the next generation to reconsider their career path, even advising other young people not to pursue a career in education. Another study conducted by Opre D., Opre A., and Zaharie M. (2012) shows that experts in the field reflect more frequently and deeply on their competencies, which contributes to the development of their expertise, while "non-experts," referring to veterans, reflect less frequently and in less detail. The quality of these reflections is greatly influenced by the knowledge and theories they have about the teaching process; the more limited the knowledge, the less developed the reflections. Another issue identified among teaching staff is the level of educational commitment and the influencing factors that affect the implementation of effective educational strategies. Stan M. found a strong connection between a high level of job satisfaction among teachers and the presence of a mentor in students' educational activities. This outcome is a crucial determining factor for academic commitment, both for teachers and students.

Given the heavy workload of teachers and the professional stress associated with the vocation, a study explored the manifestations of burnout syndrome among teaching staff in preschool and primary education, focusing on emotional exhaustion, depersonalization, and feelings of personal accomplishment. The results obtained by Sas C., Boros D., and Bonchiș E. (2011) reveal that these teachers experience a higher level of emotional exhaustion and stress compared to those in kindergartens, but there are no significant differences between the two groups regarding depersonalization and professional accomplishment. Considering the

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results obtained at this educational level, it is clear that this syndrome also exists among teaching staff in higher education. This highlights once again the need to develop educational programs aimed at managing dysfunctional emotions and preventing burnout syndrome in the professional activities of teachers. Professional stress also involves the continuous need for teachers to stay updated with developments in related fields, especially in areas such as technology, information, and communication. According to research conducted by Maican C., Cazan A-M., and Lixandriou R-C. (2019), only a small percentage of academic staff frequently use project management tools, despite the numerous project proposals at both national and international levels. A difference was also found in the use of online communication and collaboration applications, with teaching assistants more frequently using tools such as chat, document management, or mind mapping. Consequently, it can be deduced that age differences among academic staff lead to technological anxiety and stress, making it necessary for them to demonstrate self-efficacy in using technology to enhance personal resources and academic performance. Another study focused on identifying the level of stress in the academic environment and burnout syndrome, conducted by Tomulețiu, E.-A., Pop, A., Doina, D., Solovăstru, A., and Buicu, G. (2011), reconfirmed that the main sources of stress for teachers include low salaries, challenges related to an overwhelming curriculum, frequent changes in educational policies, and difficult student behaviors. It can thus be stated that teachers' satisfaction stems from personal achievement and recognition of their skills, even though inadequate salaries are no longer a motivating factor. In the absence of financial incentives, most academic staff tend to choose a secure job, even with lower pay, due to the instability of positions in education. The issue of inadequate financial recognition of work and the desire for a job with less routine and more autonomy are key aspects for university professors. Therefore, it is essential for maintaining motivation within the tertiary education system that each professor feels valued and important. Educational institutions must implement performance management systems aimed at ensuring organizational excellence so that the pedagogical talent of each educator is fully utilized. Studies in this field are extensive and consistently confirm each other intrinsically. Another study conducted by Stan M. (2013) concluded that there is a low-intensity relationship between job satisfaction and sources of stress, taking into account factors such as working conditions, interpersonal relationships, organizational climate, and structures. Rather, it was observed that professional satisfaction is influenced by intrinsic job factors, collegial relationships, and organizational hierarchy. Additionally, it was found that self-efficacy is also affected by collegial relationships, as well as the institutional structure and climate, which in turn influence the ability to cope with stress. The results also reveal that stress from pressure affects self-esteem, as teaching staff are daily convinced that they cannot fight the educational structure and climate while simultaneously achieving significant career accomplishments. Current reality reveals that teachers face higher-than-average stress levels and intense burnout, according to a study conducted by Dumitru I. and Talpoș I. (2012), which confirmed through their research the hypothesis that stress is closely linked to exhaustion. The main sources of stress among pre-university teachers were identified as low salaries, challenges associated with an overloaded curriculum, frequent changes in educational policies, problematic student behaviors, and difficulties in time management for various teaching activities. Another significant factor is emotional exhaustion, which appears to be more pronounced and frequent among female teachers with high levels of stress, compared to their male colleagues. The opinion of students regarding the educational system was studied by Gîțău R. and Măță L. (2015), with the results concluding that students believe pedagogical norms are most often violated in high schools, followed by issues in interpersonal relationships, and finally, by legal norms. Additionally, in terms of interaction with teaching staff, the most criticized aspects were assessment, teaching practices, and relational behavior. Students view assessments as overly extensive, and teachers are seen as overly strict, with teaching incompetence reflected in unethical practices related to instruction, assessment, and interaction. Moreover, the perspective of university teaching staff is more favorable, as it was observed that university students are less critical than high school students. Additional findings include that boys from urban areas tend to be more critical of teachers' morality compared to girls or boys from rural areas.

Over time, emphasis has been placed on the importance of proper professional training for teachers, as it has been observed that the Romanian educational system needs teachers who genuinely enjoy working with students. These educators must choose an appropriate communication method for each individual, taking into account the students' traits, personalities, intelligence, expectations, values, and motivations. Only in this way can persuasion, interest, and effort be effectively stimulated in students. The heavy workload currently faced by teaching staff does not only refer to teaching activities but also includes bureaucratic tasks and legislative obstacles. As a result, the university environment struggles with difficulties in training and retaining academic staff capable of delivering information in a simple and concise format, using the necessary arguments and counterarguments to help students grasp the complexity of the topics discussed in classes, as highlighted by research conducted by Bențea C. and Anghelache V. (2012). It is also essential to note that, in the context of teachers' psychopedagogical training, the adoption of a new pedagogical paradigm is necessary to improve the performance of school education. This is relevant because, although teaching staff have been trained to provide educational services, current challenges such as violence, students' psychological vulnerability, addictive behaviors, and educational dropout are increasingly part of students' needs. Therefore, it must be emphasized

that teachers should be given more time to effectively address these issues, for which they have been trained and for which they chose this profession (Ezechil L., 2013).

To complete the current picture of tertiary education in Romania, it should be noted that the presence of Romanian universities in the top 500 global rankings is limited, as indicated by the results presented by Mara D., Hunyadi D., and Mara E.-L. (2015) in their study. Although there are ongoing projects aimed at improving teacher training standards and adopting new technologies and educational methods, to indirectly enhance the education of future generations and raise the overall level of education, the results are not as expected. The digitalization of education has brought numerous significant benefits, including supporting the development of the knowledge economy and protecting the environment by reducing resource consumption. The United Nations and the World Bank have acknowledged the importance of information and communication technologies (ICT) in sustainable development, while the European Commission has emphasized the critical role of this sector in the transition to a low-carbon economy and achieving sustainable development in the EU. It is also relevant to the discussed topic to address the issue of corruption in the Romanian educational system. The National Anticorruption Directorate highlights these cases in its investigations, with the most frequent being related to corruption. A study in the field has shown that teaching staff are most often involved in cases of bribery and complicity in job appointments (Cernat V., 2024). The former can be explained by the low salary levels, which employees perceive as unmotivating, as demonstrated in the previous study, while the latter can be attributed to the decreasing number of candidates and the desire to reduce the heavy workload.

3. Research methodology

To establish the relationship between the number of individuals working as academic staff in higher education in Constanța County and the average monthly labor cost per employee in the educational system over a twelve-year period, the linear regression method was used. This method allows for the identification of the relationship between time and the variables of interest (Saunders, A., 2021), thus enabling the examination of long-term trends. The data for this study was collected from the Tempo database of the National Institute of Statistics, providing a solid foundation for the analysis conducted. The linear regression method allowed for the determination of coefficients describing the relationship between the number of academic staff working in universities in Constanța County and the average monthly salary in education. Higher or tertiary education involves completing secondary education and can be either short-term (2-3 years) or long-term (4-6 years). It includes undergraduate education lasting 3-4 or 5-6 years, master's programs, postgraduate courses/studies, doctoral programs, and postdoctoral advanced research programs (Insse.ro).

In Constanța County, there are five higher education institutions: two public universities (Ovidius University and the Maritime University), one accredited private university (Andrei Șaguna University), one military public institution (Mircea cel Bătrân Naval Academy), and one privately authorized university, Gaudeamus Foundation - Tomis University (Edu.ro). According to the National Institute of Statistics, individuals working in the educational system are classified as teaching staff whose role is to instruct and educate (either full-time or part-time). Labor cost refers to all the expenses incurred by the employing institution for its workforce. The average monthly labor cost reflects the ratio between the total labor-related expenses and the average number of employees, divided by the number of months in the year.

The data provided by the National Institute of Statistics offers information about the evolution of the number of academic staff and the average salary cost over the review period. These have been compiled into the table below.

Table 1. The evolution and annual growth index

Time (year)	Academic staff in Constanța (number of person)	The growth index of the number of academic staff (%)	Average monthly labor cost per employee in education (RON)	The growth index of the average monthly labor cost (%)
2000	886	-	386	-
2001	943	6.43	555	43.78
2002	943	0.00	727	30.99
2003	1017	7.85	890	22.42
2004	996	-2.06	1188	33.48
2005	1002	0.60	1471	23.82
2006	990	-1.20	1885	28.14
2007	1021	3.13	2079	10.29
2008	1023	0.20	2686	29.20
2009	985	-3.71	2840	5.73
2010	957	-2.84	2451	-13.70

Time (year)	Academic staff in Constanța (number of person)	The growth index of the number of academic staff (%)	Average monthly labor cost per employee in education (RON)	The growth index of the average monthly labor cost (%)
2011	949	-0.84	2333	-4.81
2012	930	-2.00	2430	4.16
2013	907	-2.47	2713	11.65
2014	922	1.65	3039	12.02
2015	906	-1.74	3238	6.55
2016	903	-0.33	3479	7.44
2017	905	0.22	4093	17.65
2018	901	-0.44	4884	19.33
2019	887	-1.55	5924	21.29
2020	878	-1.01	6237	5.28
2021	859	-2.16	6254	0.27
2022	853	-0.70	6706	7.23

Source: Own interpretation based on information collected from *Insse.ro*

As observed in the table above, there is a downward trend in the number of academic staff, with the figure for 2022 being even lower than the reference year of the study. The most favorable developments in terms of academic staff numbers occurred between 2003 and 2008, with increases of up to 7.8% (in 2003), but also declines, the largest being -3.71% (in 2009). Despite this, the average monthly labor cost showed an upward trend throughout the analysis period. This significant annual increase in the average monthly labor cost peaked at 43.78% (in 2001) and continued to rise, reaching 7.22% in 2022, although there was a decrease of -13.7% in 2010. Therefore, over the review period, it is evident that while labor costs increased significantly, the number of academic staff showed a downward trend in recent years.

The linear regression method revealed that, despite the upward trend in the average monthly salary in education, the number of people choosing a career in higher education is declining. Linear regression is a statistical technique used to model the relationship between a dependent (or response) variable and one or more independent (or explanatory) variables. In this research, linear regression was applied to determine the relationship between the number of employees in universities in Constanța County and the average monthly labor cost. Specifically, the dependent variable (Y) is the variable that is intended to be predicted or explained, in this case, the number of employees in universities in Constanța. The independent variable (X) is the variable that influences the dependent variable, namely the average monthly labor cost.

The simple linear regression equation:

$$Y = a + bX + \varepsilon$$

Excel was used as a calculation tool, utilizing the SLOPE function to determine the coefficient b (slope) and the INTERCEPT function to determine the coefficient a, with the following results: b= 992.6307 and a= -0.01851, the latter also being obtained with the help of the LINEST function. Additionally, the R-Squared coefficient of 0.42 was obtained. Therefore, it can be stated that the linear regression model for this research is the following regression equation:

$$Y=992.63-0.0185 \cdot X$$

In this case, while the model provides some insight into the relationship between labor costs and the number of employees, there is still a significant portion of the variability that the model does not explain, suggesting that other variables might be influencing the number of academic staff.

Therefore, it can be stated that for every 1 leu increase in the average monthly labor cost, the number of employees decreases, on average, by approximately 0.0185 people. Using the linear regression method, it was found that there is a significant negative relationship between the average monthly labor cost and the number of employees, suggesting that as labor costs increase, the number of employees tends to decrease. The model explains about 44% of the variation, which may indicate that other factors not included in the research model could also influence the number of employees in higher education in Constanța.

The determination coefficient (R-squared) resulted in 0.444, meaning that approximately 44.4% of the variation in the number of employees can be explained by the variation in the average monthly labor cost. The coefficient of the average monthly labor cost (X) has a P-value of 0.001, indicating that this variable is statistically significant and has an impact on the number of employees (Y).

Given the results of this research, it is pertinent to present the findings of Șerbănescu L. and Popescu T. (2014), which reveal that nearly 70% of the participants in their study choose the teaching profession out of a passion for working with students and teaching, as well as for reasons that include personal contribution to children's education and family tradition. Therefore, the desire to work with young people and the pleasure of interacting with students, expressed by current and future generations of academic staff, should be recognized and valued at both the institutional and national levels. Furthermore, negative factors such as unsatisfactory salaries, lack of financial motivation, job insecurity, and lack of professional satisfaction must be addressed. More specifically, it is essential to highlight that if the heavy responsibilities, stress, and challenges of working with students are not reduced, the effects will be damaging on a national scale. Inadequate salaries and a lack of development opportunities are major issues for both current staff and future generations, with a significant impact on the decision to pursue a teaching career.

5. Conclusions

Given the review time period, according to the report on the state of higher education in Romania for the 2022–2023 period (Ministry of Education, 2023), the pass rate was 85.2%. Out of the 415.8 thousand students enrolled at the beginning of the year in undergraduate programs nationwide, 371.2 thousand remained by the end of the year. Of those enrolled, 85.2% managed to pass, 4.1% either repeated the year, had unfinished academic situations, or interrupted their studies, while 10.7% chose to drop out during the academic year. Compared to the previous year, the percentage of those who passed saw a decrease, while the proportion of those who repeated, interrupted, or abandoned their studies showed a positive change. Improvement perspectives are evident, as a study (Roy, G. J., 2023) shows that paraprofessionals from rural communities possess valuable skills that help them become teachers. However, for this transition to be successful, it is essential to address the specific challenges they face in accessing training programs. The most significant issues include the complexity of the admission process, state-imposed requirements, certification exams, adapting courses to their experiences, and financial resources.

The conclusion of this paper leads to the idea that, for harmonious development and maintaining educational balance at the national level, it is absolutely necessary to prioritize the support and self-efficacy of teachers working in tertiary education and beyond. Self-efficacy is essentially the sum of an individual's activity choices, effort, persistence, and level of achievement. Academic staff with high levels of self-efficacy are more likely to engage actively, put in greater effort, and achieve better performance. It should be noted that self-efficacy can be shaped by behavioral and environmental factors, with the most important, according to the literature (Schunk, D. H., DiBenedetto, M. K., 2021), being progress toward set goals, personal achievements, social hierarchies, and feedback.

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