DOI: https://doi.org/10.15276/aait.06.2023.10
UDC 331.5.024.5:331.526

Gap-filling model between the labor market requirements and the standards of educational programmes for business analysts in Ukraine

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ABSTRACT

Under global competition, the training of personnel with the demanded competencies in the labor market becomes a guarantee of competitive-ness of enterprises in the digital economy. The purpose of the paper is to identify gaps in the training of business analysts between the requirements of the labor market and the standards of higher education programs in Ukraine. Paper is devoted to analysis of the IT market of Ukraine and the imbalance of competences in the IT labor market in Ukraine; comparing the requirements of employers for the competencies of IT specialists in the labor market; determining the competencies of educational programs in Ukraine according to the standards of the Ministry of Education and Science and their compliance with the requirements of the labor market for IT specialties, developing an experimental model of the impact of competencies of IT majors on the wages of business analysts. Affordable vacancies were analyzed and divided into 5 groups: Banks, Government institutions, IT, Retail and Other. These vacancies were analyzed by general competencies and specific subject competencies. After comparing, the requirements of Ukrainian employers for the position of business analyst on the job search sites the most important specific subject competencies for the IT industry were identified. Paper propose methodological approach to revise educational programmes according to market needs of employers. The ability to explain economic and social processes and phenomena based on theoretical models, to analyze and interpret the obtained results, which determines the average monthly salary increase. The ability to develop business solutions and evaluate new technological proposals leads to a decrease in salary. The ability to form new competitive ideas and implement them in projects reduces the salary, when working in positions in mature companies. Understanding flexible development processes increases the salary of employees. The proposed approach of revealing statistical significant competences can be applied to any specialty.

Keywords: Employees; competemces; IT specialty; business analyst; RStudio; Tableau

***For citation*: Kobets V. M., Koval S. V. "Gap-filling model between the labor market requirements and the standards of educational programmes for business analysts in Ukraine". *Applied Aspects of Information Technology.* 2023; Vol. 6 No. 2: 139–150. DOI: https://doi.org/10.15276/aait.06.2023.10**

INTRODUCTION

Under global competition, the training of personnel with the demanded competencies in the labor market becomes a guarantee of competitiveness of enterprises in the digital economy.

A significant discrepancy between the training of students in higher education institutions (HEI) and the requirements of employers leads to an increase in the level of structural unemployment and an increase in the employer's costs for improving the qualifications of employees.

When entrants/students plan a career in IT industry, they seek to know what specific subject and general competencies will be in demand on the labor market in the future after obtaining bachelor of master degree.

The purpose of the paper is to identify gaps in the training of business analysts between the requirements of the labor market and the standards of higher education programs in Ukraine.

Tasks of the study:

1) to analyze the IT market of Ukraine and the imbalance of competences in the IT labor market in Ukraine;

2) to compare the requirements of employers for the competencies of IT specialists in the labor market;

3) to determine the competencies of educational programs in Ukraine according to the standards of the Ministry of Education and Science and their compliance with the requirements of the labor market for IT specialties;

4) to develop an experimental model of the impact of competencies of IT majors on the wages of business analysts.

Practical meaning consists in the possibility of determining the groups of general and specific subject competences that have the greatest influence on the wage level of graduates BA and MA level of IT specialties using econometric modeling and statistical hypotheses testing, to increase the motivation of applicants to study educational components and update educational programs. The investigation presents for the firstly the methodology of introducing/revising competencies to strengthen the uniqueness of the educational programme based on the list of vacancies on the labor market and the salary of specialists.

Structure of the paper includes following structure. Chapter 1 analyzes the labor market in the IT sector of Ukraine together with educational program standards and employers' requirements. Chapter 2 analyzes data from open sources regarding vacancies based on the list of required competencies in RStudio. Chapter 3 interprets and visualizes the obtained results using Tableau interactive business analytics systems.

LITERATURE REVIEW

Standards of educational programs for IT specialists

Professional and educational standards should become elements of a unified national qualification system and should be provided as a set of interrelated documents to ensure interaction between professional education and the labor market to improve the quality of education and its competitiveness in the domestic and international markets [1]. The relationship between IT professional and educational standards is shown in Fig. 1.

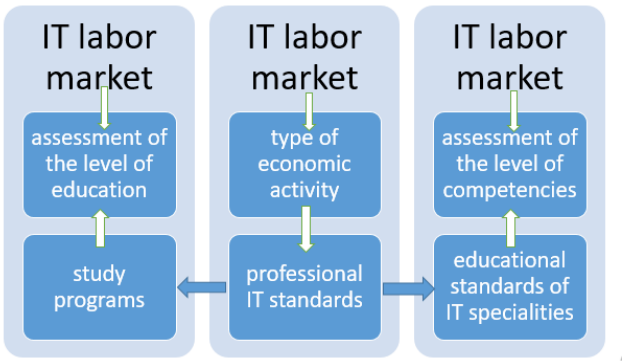

Fig. 1. **Interrelationship of professional and educational IT standards**
***Source*: compiled by the authors**

Together with the MSIS2016 computing curricula of the international IT associations and societies ACM, IEEE, AIS, AITP, guidelines on the content and professional standards of the IT industry are useful for coordinating the requirements of employers to the abilities [2].

Ukrainian system of higher education has a list of IT specialties similar to the existing specialties of higher education in EU, the USA, other developed countries [3, 4], and the recommended by Computing Curricula 2005 (Table 1).

Table 1. **IT specialties in Ukraine**

Field of knowledge	Specialty code	Specialty
12 Information technology	121	Software engineering
	122	Computer Science
	124	System analysis
	126	Information systems and technologies

***Source*: compiled by the authors**

There is intersection in the content of these four profiles. The IT industry needs competent specialists who are ready to join in IT company without additional (or significant) costs to the employer [5]. Let's consider the total number of normative competences, as well as program learning outcomes for each specialty:

– 121 Software Engineering (SE) includes 6 general competencies (GC), 11 specific subject competencies (SC) and 17 learning outcomes (LO)

– 122 Computer Science (CS) contains 9 GC, 14 SC and 13 LO

– 124 System Analysis (SA) includes 5 GK, 12 SC and 11 LO

– 126 Information Systems and Technologies contains 10 GC, 14 SC and 11 LO.

Requirements for the graduates on IT labor market

According to the data of the main job search sites in Ukraine hh.ua, work.ua, rabota.ua, djinni.co, linkedin.com, recruitika.com,jooble.org, top-5 areas with the highest demand and supply since 2020 information technologies continue to lead [6]. Approximately 14 % of vacancies on average account for 12 % of resume [7].

For the current period business analyst is the most modern and demanded vacancy on the labor market. A system analyst/business analyst is engaged in data analysis of a domain area of the company's activity, based on calculations, forecasting and recommendations using machine learning for the development of a certain industry, researches and models the company's business processes [8].

ISSN 2617-4316 (Print)
ISSN 2663-7723 (Online)

Aaron Whittenberger, a business analyst from Cincinnati (Ohio, USA) at the International Institute for Business Analysis (IIBA®) identified several key trends:

1. In the future, the demand for business analysts will grow, as business management becomes more and more complex.

2. Business analysis continues to turn into a profession with rapid career growth.

3. The processes of business analyst, system analyst, organizer and controller of business processes are increasingly converging.

4. In small and medium-sized enterprises (SME), business analysts perform the functions of project managers.

5. Business analysts will play a decisive role in justifying decisions and implementing investment and start up projects.

Requirements for soft skills of business analysts [9]: analytical thinking, critical thinking, system thinking, quick learning of new information, ability to negotiate [10, 11], [12, 13].

Business analytics (BA) helps firms, regardless of their size, to determine the best opportunities for their development and increase productivity for survival under global and regional competition [14]. Business intelligence facilitates the acquisition of important insights from an extensive set of unstructured data, subsequently converting it into actionable information, thereby empowering organizations to make well-informed decision making and enhance business efficiency as well as productivity [15]. The aim of business intelligence is to research, integrate, logically grab, and multi-dimensionally analyze data from various sources of information about customers, environment, competitors, markets, etc. to improve business performance, especially startups; business analytics increases innovation and improves financial results of startups [16].

Authors [17] ‘suggest that BA skills are necessary but insufficient for digital innovation because BA culture demonstrates a stronger effect in complementing organizations’ existing capabilities than BA skills do’. So, to build relevant model of production and service, it is necessary economic domain, mathematics, statistics, machine learning and soft skils of BA [18].

National studies demonstrate the automation of routine business processes through the means of business analysts, who help to reduce the time for the implementation of projects and start-ups and reduce the cost of digital services [19, 20], [21].

To fill a vacancy of a business analyst, firm determines the list of general and specific subject competencies in the vacancy, the presence of which allows the firm to make personnel decisions using, e.g., some web-service [22, 23]. At the same time, the formulation of competencies by a firm and a higher education institution may differ significantly, which requires their matching.

Some researchers [24, 25] determine the competencies of a business analyst in a narrow field, but do not propose a methodological approach that would help higher educational institutes to match the competencies of the labor market and the national standard of the specialty. Therefore, to fill this gap, we offer our own author's approach.

MODEL FOR SUBSTANTIATING THE COMPETENCIES OF A BUSINESS ANALYST ON THE LABOR MARKET

During reviewing process of educational programmes (EP), there is a need to determine their uniqueness in the global or regional labor market. To determine the uniqueness of the EP, the most demanded competencies above the standard of the relevant specialty are introduced. At Kherson State University, business analytics is represented by a list of mandatory or optional disciplines from specialties 121, 122 and 126 in the field of Information Technology. Business analytics makes it possible to strengthen the uniqueness of relevant educational programmes and there is a necessity to define a list of such competencies that would allow preparing a competitive specialist in the labor market.

To justify the list of new competencies, we propose to build a multiple regression model:

$$w_i = b_0 + \sum_{j=1}^{13} b_j \cdot GC_j + \sum_{k=1}^{15} a_k \cdot SC_k + u_i$$

where dependent variable is the salary of employees w_i in the labor market, specified in the job description, and the explanatory variables are the competencies that firms define in their requirements for applicants for these vacancies. Competencies consist of two components – general competencies or soft skills (GC_j) and specific subject competencies (SC_k). GC_j and SC_k are dummy variables that take the value “0” if they are absent and “1” if they are present as requiremet in the vacancy;

– b_0 presents the salary of a specialist who does not possess any of the competencies (both GC_j and SC_k) declared in the vacancy;

– b_j demonstrates how much the specialist's salary will change on average if he/she has the general competence GC_j (when GC_j changes from 0 to 1);

– a_k displays how much the specialist's salary will change on average if he/she has professional competence SC_k (when SC_k changes from 0 to 1);

– u_i shows the error of the model, which takes into account the impact of all factors not included in the model (e.g., age, education level, residence, etc.).

After checking the parameters for statistical significance, it is possible to determine those competencies that have a significant positive impact on the graduates' salaries and therefore can be considered for their inclusion in the corresponding educational programme. We propose to consider forming of business analyst wage in "normal" conditions (before COVID pandemic and Russia's war against Ukraine).

METHODS OF DATA ANALYSIS FROM OPEN SOURCES ABOUT VACANCIES ACCORDING TO THE LIST OF COMPETENCES IN RSTUDIO

Higher educational institutes (HEIs) that prepare business analysts have to develop study plans and foundations for the educational process of graduates, general (GC) and specific subject competences (SC) in accordance with the standards of the Ministry of Education and Science (MES) in the fields of system analysis (124), economics (051, economic cybernetics), information systems and technologies (126) [12].

We conducted a comparative analysis of GC and SC in accordance with the approved standards of the MES of Ukraine for specialties 051, 124, 126, in order to meet the qualifications of a business analyst [13]. As a result, 18 general (Table 2) and 22 special competencies (Table 3) were obtained.

Table 2. **General competences of business analyst at higher educational institute**

No.	General competences for a business analyst
1	Ability to be critical and self-critical
2	Ability to learn and possess modern knowledge
3	Ability to generate new ideas (creativity)
4	Able to be socially responsible and consciously take actions
5	Abstract thinking, analysis and design skills
6	Ability to adapt to new situations and act
7	Ability to search, process and analyze information from various sources
8	Ability to apply knowledge in practical situations
9	Ability to evaluate and ensure the quality of the work performed
10	Ability to plan and manage time
11	Ability to work independently
12	Ability to work in a team
13	Ability to make informed decisions
14	Ability to develop and manage projects
15	Ability to communicate in the state language orally and in writing
16	Ability to communicate in a foreign language and work in an international context
17	Information and communication technology skills
18	Interpersonal skills

***Source*: compiled by the authors**

Table 3. **Specific subject competences of business analysts at higher educational institute**

No.	Specific subject competencies of a business analyst
1	Ability to recognize knowledge and understand the problems of the subject area, basic knowledge of the modern economy at the micro, meso, macro and international levels
2	Ability to explain economic and social processes and phenomena through theoretical models for analysis and interpretation of results
3	Ability to formalize problems described in natural language using mathematics. General methods are also suitable for mathematical modeling of specific processes
4	Ability to establish correct static and dynamic models of processes, as well as systems with distributed and grouped parameters, taking into account the uncertainty of external and internal factors
5	Ability to use modern information technologies to implement machine control, implement mathematical models and predict the behavior of specific systems, namely: object-oriented methods of designing various types of complex systems, use of mathematical packages, use of databases and knowledge
6	Ability to determine the impact of material, economic, social processes, random and uncertain indicators, they are in study of random or fuzzy quantities, vectors, processes and their relationships
7	Ability to analyze and design complex systems and create appropriate information technology and software
8	Ability to design experiments and observational studies and analyze the results
9	Ability to analyze, synthesize and optimize the use of information systems and technologies, mathematical models and methods
10	Ability to perform simulation experiments, compare the results of experimental data and obtained solutions
11	Ability to use computer technology and data processing software to solve economic issues, analyze information and prepare analytical reports
12	Ability to analyze and solve problems in the field of economic and social-labor relations
13	Ability to forecast socio-economic processes based on standard theoretical and econometric models
14	Ability to use modern sources of economy, management, accounting. To have information for the preparation of official documents and analytical reports
15	Ability to conduct economic analysis of business activity and development business entities, assess their competitiveness

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ISSN 2663-7723 (Online)

Table 3 (continued)

No.	Specific subject competencies of a business analyst
17	Ability to formulate optimization problems in the design of management and decision-making systems, namely: mathematical models, optimal criteria, constraints, management goals and choose reasonable methods and algorithms for solving optimization and optimal management
18	Ability to apply information technologies to create, implement and use a quality management system and estimate its development and maintenance costs
19	Ability to manage the quality of information system products and services. Technology goes through the entire life cycle
20	Ability to develop business solutions and evaluate new technical proposals
21	Ability to manage and use modern information and communication systems and technologies (including the Internet)
22	Ability to create new competitive ideas and implement them into projects (startups)

***Source*: compiled by the authors**

We analyzed the general requirements of employers for competencies applicants for the position of business analyst on job search sites: work.ua, rabota.ua, djinni.co, linkedin.com, hh.ua, it-stars.ua, jobs.ua and compared them with the standards of the MES of Ukraine (Table 2 and Table 3) [12]. As a result, we defined general (link Appendix B) and professional common competencies both for the labor market and for HEI [12].

Based on open sources of job search websites, we have selected 61 vacancies for the position of business analyst. This data set includes the name of the employer, the vacancies, average wage and the required general and specific subject competencies.

All vacancies can be classified by the following industries: IT consulting (21), Banks (5), Retail trade (9), Government agencies (2), Other (24) (includes mobile operators, agriculture, oil, etc.).

To determine the statistical significance of the impact of GC and SC regarding their impact on the average wage of a business analyst, consider the multiple regression models:

$$w_i = b_0 + \sum_{j=1}^{13} b_j \cdot GC_j + \sum_{k=1}^{15} a_k \cdot SC_k + \\ + u_i, \quad (1)$$

where w_i – average wage for the position i;

GC_j – general competence j; SC_k – specific subject competence k, u_i – error term.

Based on the construction of a multiple regression (Table 4) in RStudio, statistically significant competencies for wages were determined for the sample of business analyst positions, where Pr(>|t|) shows the probability of no effect of a competence on wage.

Table 4. **The impact of general competencies (GC) and specific subject (SC) competencies on the wages of business analysts**

Competences	Parameters b_j, a_k	Pr(>|t|)
Intercept (bo)	32417.96	2.16e-08 ***
GC1	795.93	0.80254
GC2	-96.87	0.97387
GC3	-2173.50	0.68091
GC4	-11505.49	0.09392
GC5	2486.66	0.67967
GC6	10711.01	0.16368
GC7	802.84	0.86873
GC8	7493.44	0.14707
GC9	1975.72	0.61508
GC10	2459.58	0.47564
GC11	10196.31	0.05514.
GC12	-1656.79	0.71887
GC13	-4137.57	0.32933
SC1	8622.73	0.04521 *
SC2	-1329.63	0.70989
SC3	-6282.48	0.30283
SC4	-108.81	0.97112
SC5	-180.52	0.96006
SC6	-4150.18	0.39438
SC7	-5209.61	0.30639
SC8	5049.44	0.14594
SC9	4161.96	0.40459
SC10	-2721.99	0.52695
SC11	-2322.82	0.70943
SC12	-6879.35	0.05634.
SC13	4919.61	0.35323
SC14	-8469.35	0.09476.
SC15	10870.36	0.00432 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

***Source*: compiled by the authors**

First column Estimates present marginal effect of corresponding competence (the more value of parameter the more marginal wage and vice versa). Last column Pr (>|t|) demonstrates probability that explanatory variable does not have impact on wage of byseness analyst (the less value, the more probability of signicant impact of a factor on wage).

Among all competences, only two of them have greatest impact on business analyst wage:

1) the use of information and communication technologies or presentation skills (GC11) can increase the average monthly wage by UAH 10,196.31;

2) the ability to build correct models of static and dynamic processes, as well as systems with distributed and grouped parameters, taking into account the uncertainty of external and internal factors (GC4) causes a decrease in wages by UAH 11,505 for automated business processes (Table 5).

Table 5. **Statistically significant competencies in the labor market**

Model	Explanatory competences	Marginal effect of parameters
All	GC11 GC4	-11505 +10196
IT consuling	SC1 SC12	+8622 - 6879
Banks	NA	NA
Retail	No	NA
Others	SC14 SC15	- 8469 +10879

***Source*: compiled by the authors**

Among the applicants for the vacancy of business analyst with competence GC11 only 10 % have concurrent competence GC6, and vice versa: if a candidate has a GC4, only one in ten has a GC11.

The most important specific subject competencies for the IT industry were identified:

1. The ability to explain economic and social processes and phenomena based on theoretical models, to analyze and interpret the obtained results. SC1 determined the average monthly wage increase by + UAH 8622.

2. The ability to develop business solutions and evaluate new technological proposals SC12 leads to a decrease in salary by UAH 6879 (in positions where the necessary business solutions and technological know-how are implemented).

In addition, if the applicant has the SC1 competence for the vacancies of business analyst, his/her average wage remains lower than in the case of other required competences.

For other positions not covered by IT consulting, state institutions, banks, the most necessary competencies were identified:

3) The ability to form new competitive ideas and implement them in projects (start-ups) SC14 reduces the wage by UAH 8469 monthly (when working in positions in mature companies).

4) Understanding flexible development processes (for example, Scrum, SDLC, Kanban) SC15 increases the wage by UAH +10879.

If we build linear model that contain only statistically significant competencies we will get (Table 6):

```
lm(formula = Wage ~ GC4 + GC11 + SC1 + SC12 +
SC14 + SC15, data = f)
```

Table 6. **The impact of statistically significant general (GC) and specific subject (SC) competencies on the wages of business analysts**

Competences	Estimate	Pr(>|t|)
Intercept b0	34966	< 2e-16 ***
GC4	-8515	0.06434.
GC11	5778	0.16067
SC1	9720	0.00457 **
SC12	-6196	0.01917 *
SC14	-6883	0.09321.
SC15	7154	0.01786 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Multiple R-squared: 0.3504, Adjusted R-squared: 0.2782
***Source*: compiled by the authors**

If only 6 statistically significant variables are left in the multiple regressions instead of the initial 28 explanatory variables, the adequacy of the regression by the determination coefficient will decrease from 65 % to 35 %. Thus, 22 statistically insignificant variables account for only 30 % of the variation in wage for business analysts, while 6 significant variables account for 35 % of the variation in wage.

Salary distribution of business analysts

For a sample of business analyst vacancies, the modal salary is UAH 40,000 per month. The median salary of a business analyst is UAH 32,000 (Fig. 2).

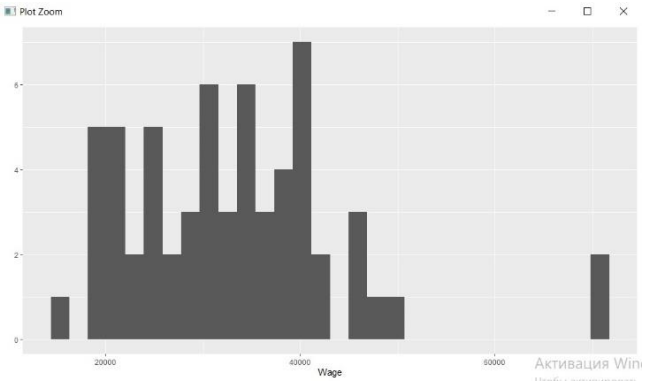

Fig. 2. **Salary distribution of business analysts, 2020 (x-axis is a wage, y-axis is a number of business analysts)**
***Source*: compiled by the authors**

The impact of SC15 on the wage of business analysts is presented in Fig. 3.

Business analysts with SC15 receive a higher wage of UAH 35,000 per month or more. With a wage less than UAH 35,000 employees without SC15 receive a higher wage (Fig. 4).

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ISSN 2663-7723 (Online)

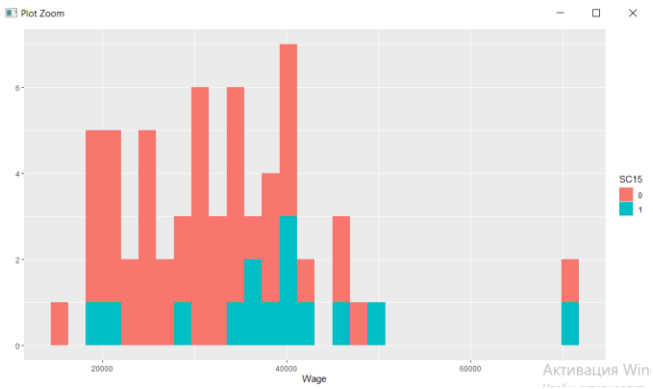

Fig. 3. **The impact of SC15 on wage of business analysts, 2020 (the index "1" means the impact of SC15)**
***Source*: compiled by the authors**

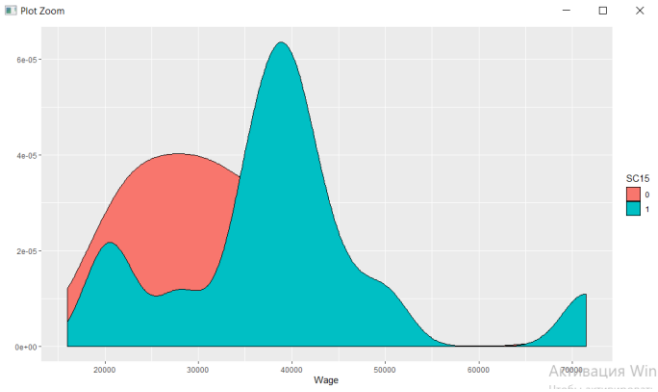

Fig. 4. **The impact of SC15 competence on the salary of business analysts, 2020 (index "0" means no SC15)**
***Source*: compiled by the authors**

The salary of BA with SC15 is higher (right side) than those who do not have this competence (left side) (Fig. 5).

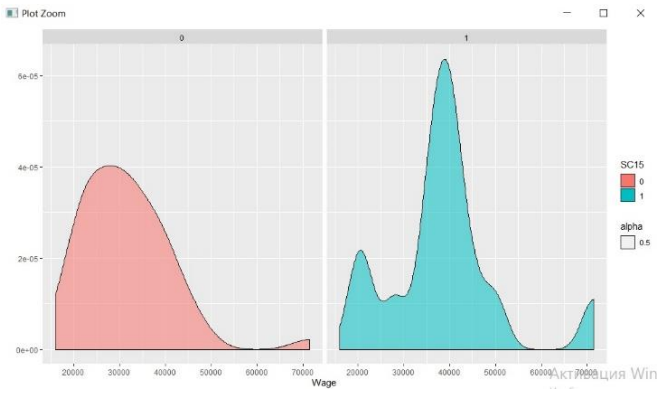

Fig. 5. **The impact of SC15 competence on the salary of business analysts in 2020 (index "0" means no SC15)**
***Source*: compiled by the authors**

We will consider 3 models in which we will investigate the impact of statistically significant competencies on the salary of business analysts. Model 1 includes 3 competencies: GC11, SC1 and SC15. Model 2 includes 4 competencies: GC4, GC11, SC1 and SC15. Model 3 includes 6 competencies: GC4, GC11, SC1, SC15, SC12 and SC14.

model0: $w_i = b_0 + b_{11} \cdot GC_{11} + a_1 \cdot SC_1 + a_{15} \cdot SC_{15} + u_i$
model1: $w_i = b_0 + b_4 \cdot GC_4 + b_{11} \cdot GC_{11} + a_1 \cdot SC_1 + a_{15} \cdot SC_{15} + u_i$
model2: $w_i = b_0 + b_4 \cdot GC_4 + b_{11} \cdot GC_{11} + a_1 \cdot SC_1 + a_{12} \cdot SC_{12} + a_{14} \cdot SC_{14} + a_{15} \cdot SC_{15} + u_i$

	model0	model1	model2
(Intercept)	29483.555***	30165.048***	34965.558***
	(1640.411)	(1643.322)	(2398.617)
GC11: 1/0	4658.827	5254.347	5778.366
	(4366.942)	(4281.129)	(4062.460)
SC1: 1/0	9145.710*	10499.250**	9719.493**
	(3464.780)	(3461.388)	(3284.305)
SC15: 1/0	7349.507*	6377.970*	7153.801*
	(3101.130)	(3074.693)	(2928.018)
GC4		-9015.617	-8514.606
		(4734.473)	(4508.796)
SC12			-6196.320*
			(2566.151)
SC14			-6883.154
			(4027.772)
R-squared	0.198	0.246	0.350
No.	61	61	61

Significance: *** = p < 0.001; ** = p < 0.01; * = p < 0.05

model0: $w_i = 29484 + 4659 \cdot GC_{11} + 9146 \cdot SC_1 + 7350 \cdot SC_{15}$
model1: $w_i = 30165 - 9016 \cdot GC_4 + 5254 \cdot GC_{11} + 10499 \cdot SC_1 + 6378 \cdot SC_{15}$
model2: $w_i = 34966 - 8515 \cdot GC_4 + 5778 \cdot GC_{11} + 9719 \cdot SC_1 - 6196 \cdot SC_{12} - 6883 \cdot SC_{14} + 7154 \cdot SC_{15}$

Based on the comparison of these models, it was determined that the 3rd model (model2) is the most qualitative according to the determination criterion. For this model, we will analyze the impact of SC15 competence on the change in wages (Fig. 6). SC15 can increase wage from UAH 30000 till UAH 40000.

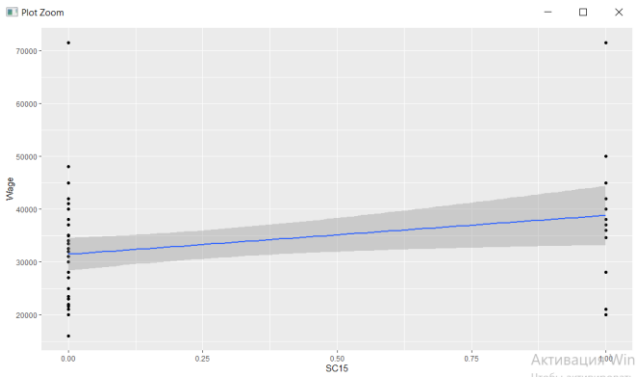

Fig. 6. **Impact of SC15 on business analyst salary in multiple regression**

***Source*: compiled by the authors**

The salary of a business analyst increases from UAH 32,000 up to UAH 38,000 if SC15 is included (Fig. 7).

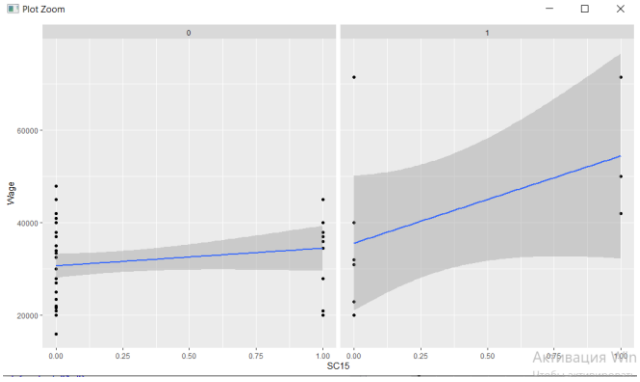

Fig. 7. **Change in the salary of a business analyst in the absence/presence of SC1 and SC15 (left and right, respectively)**

***Source*: compiled by the authors**

For SC1 wage will increase from 35,000 to 55,000 if SC15 confirmed. In SC1 absent, wage will increase much more slowly from 30,000 to 32,000 if SC15 confirmed.

SIMULATION OF IT SPECIALISTS COMPETENCIES IMPACT ON BUSINESS ANALYST WAGE IN TABLEAU INTERACTIVE SYSTEM

Tableau as BI service can visualize the results of our models for all groups – Banks, Government institutions, IT, Retail, Other.

The interactive Tableau system made it possible to visualize following issues:

– dependence between wage and competences;

– difference in wages for various positions of business analysts;

– the impact of the competencies of each group on the wage.

Below are the graphical results of model calculations for all groups. Having graphically depicted the relationship between wage and general competencies in the Banks group (Fig. 8), we can say that the highest salary is presented in the vacancy of a business analyst of OTP bank UAH 40,000, while it is in this vacancy there is only 1 general competence. The UKRSIBBANK BNP Paribas Group vacancy has the same number of general competence, but wage is UAH 28,000, which is significantly different from the OTP bank.

The largest list of GC (5) is present in the vacancy of the Southern Joint Stock Bank. The wage of the vacancy is 27,000 UAH. Fig. 8 presents wage with ("0") and without ("1") corresponding competence.

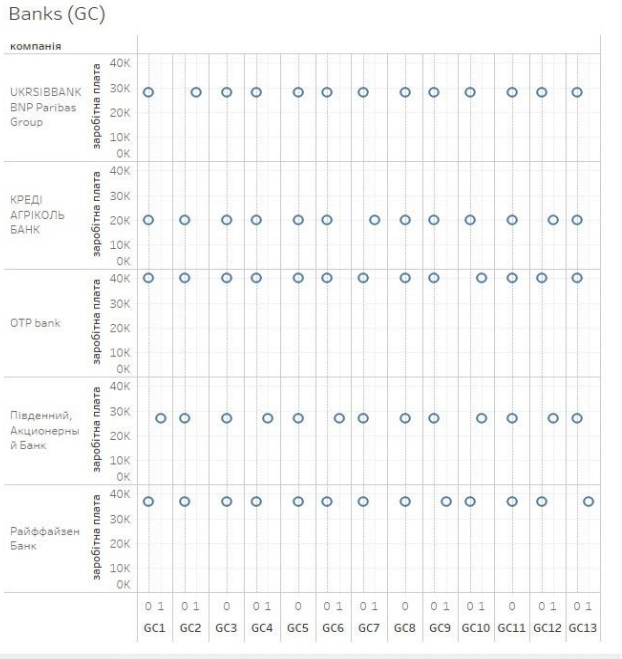

Fig. 8. **Dependence between wage and GCs for banks**

***Source*: compiled by the authors**

Analyzing the relationship between wage and specific subject competencies in the Banks group (Fig. 9), we will find that with the largest number of SCs in the Raiffeisen Bank vacancy (5), the wage is UAH 37,000. The situation with the dependence between the wage and specific subject competences in the OTP Bank vacancies compared to the dependence between the wage and GCs has changed. With a wage of UAH 40,000, the number of required competencies is 3.

Therefore, the relationship between wage and competences in the Banks group is ambiguous, and the financial stability and capital of the bank play a significant role in determining wages for vacancies in this group.

ISSN 2617-4316 (Print)
ISSN 2663-7723 (Online)

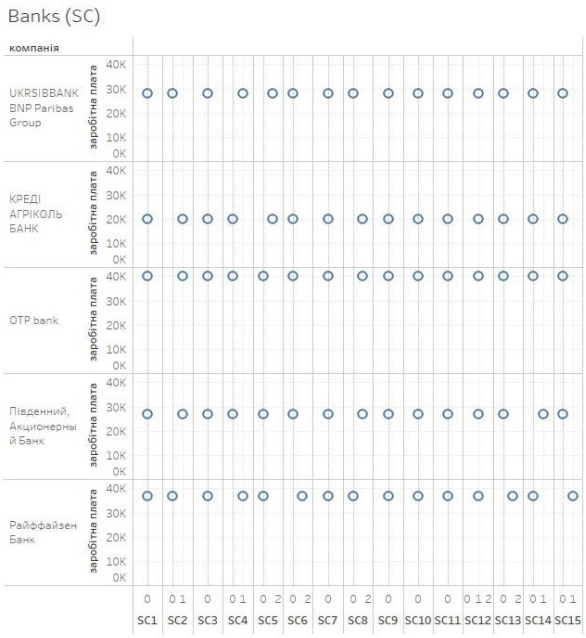

Fig. 9. **Dependence between wage and SCs for banks**
***Source*: compiled by the authors**

In the data set of Government institutions, the formation of the wage level is directly affected by specific subject competencies. Visually depicting the relationship between wage and GCs in the IT group (Fig. 10), we can see that it is in this group that there is a direct relationship between wage and GCs. The highest salaries in AI Helps are UAH 71,500 and NIX - UAH 71,500 and the number of competencies are 5 and 4 correspondingly.

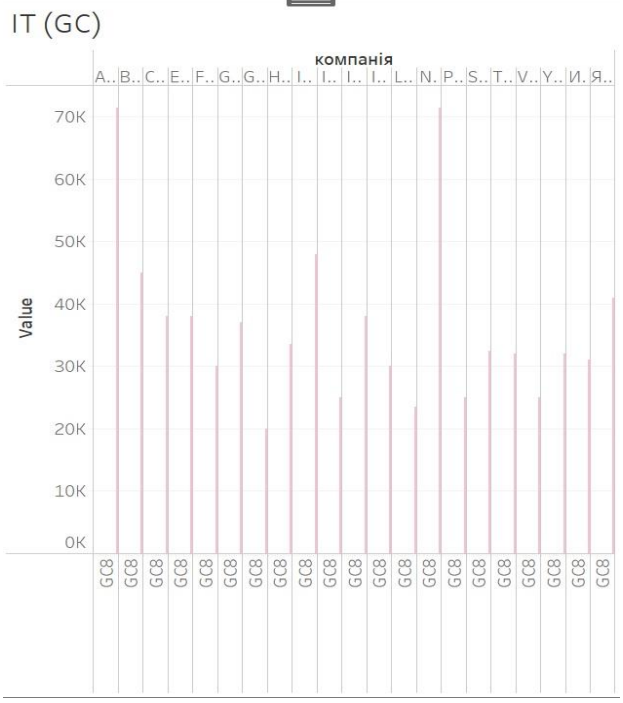

Fig. 10. **Dependence between wage and GCs for IT**
***Source*: compiled by the authors**

Analyzing the relationship between salary and general competencies in the Retail trade group (Fig. 11), we can see that the formation of wage level in this group does not depend on GCs. As an example, the highest salary in Brocard-Ukraine is UAH 50,000, where the number of competencies is 1.

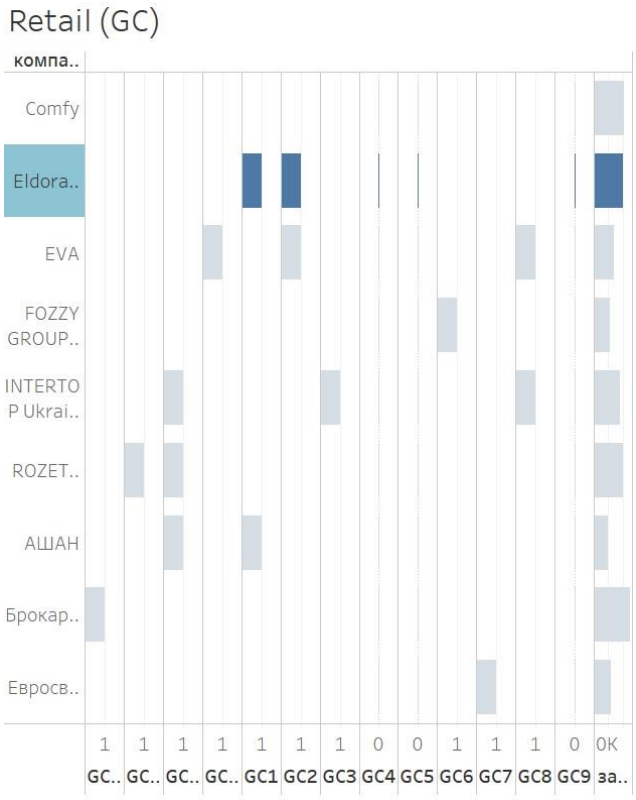

Fig. 11. **Dependence between wage and GCs for retail trade**
***Source*: compiled by the authors**

Therefore, we found that far from all companies in 5 groups the dependence between competencies and wages is tracked.

CONCLUSIONS

Having analyzed the IT market of Ukraine, we revealed that the imbalance of competences in the IT labor market is undeniably present. The IT industry needs specialists who are competent in their field, ready to successfully enter to IT company. That is why HEIs of Ukraine for the preparation of business analysts should improve the study programs and the content of the educational process in order to form the general and specific subject competencies of graduates that are in demand on the labor market. We conclude that there is not always a correlation between wages of firms and different competencies of graduates.

Exactly 61 vacancies were analyzed and divided into 5 groups: Banks (5), Government institutions

(2), IT (21), Retail (9) and other (24). These vacancies were analyzed by general competencies (13) and professional competencies (15).

After comparing, the requirements of Ukrainian employers for the position of business analyst on the job search sites the most important specific subject competencies for the IT industry were identified:

The ability to explain economic and social processes and phenomena on the basis of theoretical models, to analyze and interpret the obtained results, which determines the average monthly salary increase of UAH 8.622 and is recommended to be added to list of general competences;

The ability to develop business solutions and evaluate new technological proposals leads to a decrease in salary by UAH 6.879 (in positions where the necessary business solutions and technological know-how are implemented). It depends on demand of current vacancies of existing firms;

The ability to form new competitive ideas and implement them in projects (start-up companies) reduces the salary by UAH 8.469 monthly (when working in positions in mature companies). It also depends on demand of current vacancies of existing firms;

Understanding flexible development processes (for example, Scrum, SDLC, Kanban) increases the salary by UAH 10.879 and is recommended to be added to list of specific subject competences.

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Conflicts of Interest: The authors declare that there is no conflict of interest

Received 14.03.2023
Received after revision 18.05.2023
Accepted 08.06.2023

DOI: https://doi.org/10.15276/aait.06.2023.10
УДК 331.5.024.5:331.526

Подолання розриву між вимогами ринку праці та стандартами освітніх програм в Україні для бізнес-аналітиків

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АНОТАЦІЯ

В умовах глобальної конкуренції підготовка кадрів із затребуваними на ринку праці компетентностями стає запорукою конкурентоспроможності підприємств у цифровій економіці. Метою роботи є виявлення невідподвіностей у підготовці бізнес-аналітиків між вимогами ринку праці та стандартами програм вищої освіти в Україні. Стаття присвячена аналізу ІТ-ринку України та виявленню дисбалансу компетентностей на ІТ-ринку праці в Україні; порівнянню вимог роботодавців до компетентностей ІТ-фахівців на ринку праці; визначення компетентностей освітніх програм в Україні за стандартами МОН та їх відповідності вимогам ринку праці для ІТ-спеціальностей, розробці експериментальної моделі впливу компетентностей ІТ спеціальностей на заробітну плату бізнес-аналітиків. Були проаналізовані доступні вакансії та розділено їх на 5 груп: банки, державні установи, ІТ, роздрібна торгівля та інше. Ці вакансії були проаналізовані за загальними та фаховими компетентностями. Після порівняння вимог українських роботодавців до посади бізнес-аналітика на сайтах пошуку роботи визначено найважливіші професійні компетенції для ІТ-галузі. Здатність пояснювати економічні та соціальні процеси та явища на основі теоретичних моделей, аналізувати та інтерпретувати отримані результати, що зумовлює підвищення середньомісячної заробітної плати. Здатність розробляти бізнес-рішення та оцінювати нові технологічні пропозиції призводить до зниження зарплати. Уміння формувати нові конкурентоспроможні ідеї та втілювати їх у проекти знижує зарплату при роботі на посадах у зрілих компаніях. Розуміння гнучких процесів розробки підвищує зарплату. У статті пропонується методологічний підхід до перегляду освітніх програм у відповідності до потреб ринку праці. Запропонований підхід виявлення статистично значимих компетентностей може бути застосований до будь-якої спеціальності.

Ключові слова: Роботодавці; компетентності; ІТ-спеціальність; бізнес-аналітик; RStudio, Tableau

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