

Model for assessment the dynamic capabilities of the university personnel using future classroom toolkit

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Abstract — The article discusses the results of research conducted by the authors in recent years. The necessity and topicality of the study is determined by the fundamental changes in the educational space as a result of the use of qualitatively new digital technologies. In their turn, universities have been faced with heightened requirements for efficiency and effectiveness of the teachers work, which implies, among all other things, dynamic capability of the university staff to use modern technological advancements. In a market economy, the above processes may be described by the System of National Accounts, which has been updated in recent years. The assessment model presented in the article allows determining changes in the dynamic capabilities of the university personnel as a result of the use of digital technologies. The assessment is based on the ratios of the primary and auxiliary charts of accounts.

Keywords — *Future Classroom Toolkit (FCT), dynamic capabilities of staff, System of National Accounts (SNA)*

I. INTRODUCTION

The economic reforms of the early 2000s were mostly associated with two decisions in the field of education. Firstly, the Russian Federation joined the Magna Charta Universitatum, which indicated a firm commitment of education authorities to application of new methods of work that would not allow the Russian universities to fall behind in educational innovation [1,P.27]. Secondly, it was the time when all universities adopted a new system of budget accounting, which changed the financial and economic activities of educational institutions on the basis of their maximum automation. However, this measure was planned much earlier in the period of President Yeltsin and was reflected in the Government program on transition of the Russian Federation towards internationally accepted accounting and statistic system in accordance with the requirements of market economy and based on System of National Accounts (SNA) [2, P.1]. Gradual transition of the universities to open education philosophy encompasses resources, tools and practices that require active use of modern digital technologies and contribute to the development of the teachers capability to create a new quality of educational environment. The objective of this article is to develop a model for assessment of the dynamic capabilities of the university personnel applying the concept of Future Classroom Toolkit (FCT) as a measure of such capabilities. By dynamic capabilities of the university personnel we understand the teachers' ability to sustain a competitive

advantage in highly dynamic environments by thinking about how education might need to evolve in the coming years.

Taking into account the objective outlined above, it was necessary to identify the required FCT and to use it in a model for assessing the dynamic capabilities of the university personnel.

II. RESEARCH METHODOLOGY

The process of scientific investigation of the problems associated with the FCT use is only at the beginning of its formation. There are several approaches to understanding of the FCT application. First of all, these approaches entail retrospective analysis [3, P.66], econometric interpretation [4, pp.91-92] and research at the regional level [5, pp.23-24]. Also it is useful to bear in mind that many of the foreign researchers focus on the socio-reflexive aspects of the FCT use [6, pp.4-9; 7, pp.82-84; 8, P.96; 9, pp.114-12; 10, pp.563-566].

The multi-factor field of the FCT study implies such tools that ensure the development of dynamic capabilities of the university staff. The FCT are represented by the developer's Web site, which includes the following functionals:

- 1) Corporate mail (CM);
- 2) Education Management Information System (EMIS);
- 3) Portal of electronic educational resources (EER);
- 4) Information Library Complex (ILC);
- 5) "Science" Portal.

Our analysis show, that these instruments are mandatory for the modern level of educational environment in each university.

Study of the first functional involves collection of all documents for the maximum possible period of time. Out of them, the documents connected with the FCT are retrieved, further detailization of which makes it possible not only to identify the level of the personnel awareness and orientation in the educational space of the university, but the demand from teachers for specific information related to the FCT. Written documents organized in different folders and subfolders (orders, regulatory memorandums, notifications) are characterized by their content that corresponds to the items of the auxiliary chart of SNA accounts, proposed by the developer. They correlate with the items of the primary chart

of accounts of the system recommended by the Federal State Statistics Service (Rosstat). The obtained ratio allows assessing the staff dynamic capabilities as a result of creating a Future Classroom Scenarios as a vision for change on the basis of innovative use of ICT.

Data bank created on the basis of the EMIS, the EER, the ILC, the "Science" Portal and the information obtained thereof may be conventionally subdivided into information that is necessary for the teachers' day-to-day work and the information that ensures the strategic component of this work. Both types of information are closely interrelated and interdependent, therefore, for the purposes of this study, it is assumed that the dynamic capabilities of teachers are determined only by interaction with students within the framework of the formal rating system and by interaction with the administration of the university departments (faculties) in the process of paperwork. Therefore, standard time, which determines the quantity and quality of educational and methodical work is the basis for calculating teachers' the added value within the primary chart of SNA accounts. Moreover, the classes conducted using diverse multimedia technology, including on-line tools, as well as special and integrated software (i-exam) are described in the items of the auxiliary chart of the SNA accounts. The collected and processed information not only reveals the strategic nature of the teachers' activities based on the available digital technologies, but make it possible to assess the teachers' capability to anticipate and create work programs for the future. In this case, we are talking about the revised information, that is, about the knowledge that the teachers "have accumulated", using the EMIS, the EER, the ILC, the "Science" Portal. However, the assessment of the teachers' dynamic capabilities is possible only on the basis of the auxiliary chart of the SNA accounts. The ratios between the items of the auxiliary chart and the items recommended by the Rosstat create a database, which is a kind of feedback for the FCT developers.

Based on the study of modern concepts of dynamic capabilities of an enterprise [11, P.272; 12, P5; 13, P.1117; 14, P.21; 15, P.512; 16, P.993], we have defined the essence of the dynamic capabilities of the university personnel as way for the teachers to gain competitive advantage as a result of the FCT use. Within the framework of market economy, such competitive advantage is evaluated based on the national accounting methodology. In this connection, the evaluation criteria for dynamic capabilities of the university teaching staff in the context of the FCT are determined on the basis of the recommendations provided by the Rosstat, which is currently working on a step-by-step transition to the updated methodology of the new SNA standard adopted in 2008 by the United Nations (UNSNA 2008) [17, P.9].

The conducted analysis shows that the 2008 SNA is based both on the existing theoretical concepts, research methods and tools, which reflect modern economic phenomena, and new ideas about business operations under the conditions of formation and development of the global information society [18, P.74]. Similar to the Revision of 1993, the 2008 SNA Revision is based on the market equilibrium model. [19, P.11]. In our opinion, the informational support of reproduction process management predetermines two approaches to account management: substantive, i.e., related to property, capital turnover, profits and their attributes, and methodological, i.e.,

the chart of the accounts itself. Under these conditions, "accounting should be considered as part of political economy" [20, P.40]. The very essence of economic equilibrium allows us to consider it as a constant oscillation from one pole of the system quality to another. Under these conditions, the peculiarities of commercial operations are manifested through interaction between the micro level (independent manufacturers, certain types of activities and isolated enterprises) and the macro level (groups of enterprises, territories, domestic and national economies). These processes are characterized either by unhealthy rivalry between employees, which objectively reflects limited ability to think rationally, or friendly competition, which is indicative of the ways of behaving that are shared by most people. Moreover, it is possible to evaluate the forms of manifestation, and, consequently, the essence of the equilibrium-nonequilibrium state in terms of the dominant historical and economic conditions, which result in the corresponding managerial solutions at the micro and macro levels.

Having generalized the existing theoretical approaches to the development of national accounting methods, the authors formulated the indicator, which characterizes reliability of interacting counterparties, and which allows differentiating the assessment of the staff dynamic capabilities at the micro level. Thus, the highest reliability level is attributed to the counterparties with the highest index of dynamic capabilities. By this, we mean the personnel, for whom the salary is determined by the ratio between the workplace load (teaching load) and price level; the volume of services rendered is inversely proportional to the amount of savings; the added value is inversely proportional to cash balance for saving purposes; the amount of transfer payments is inversely proportional to the amount of disposable income. The following level is occupied by the personnel, whose salary is determined by a constant ratio between the marginal efficiency of capital and the marginal propensity to consume; the volume of services rendered is inversely proportional to the relation between the marginal propensity to consume and the marginal propensity to invest; the added value is proportional to the amount of cash balance for saving purposes; the volume of transfer payments is directly proportional to the marginal propensity to consume.

The level of normal dynamic capabilities of the university personnel is determined by the salaries, which are directly proportional to the ability to apply the FCT and the values of the production function; the volume of services rendered is directly proportional to the level of interest rates of the Central Bank; the added value is directly proportional to the amount of adjusted income; the amount of transfer payments is directly proportional to the amount of investment in research and development work.

The level of low dynamic abilities of the university staff is characterized by the salaries, which are determined by the constant ratio of the FCT involved in production (production limit of FCT); the volume of services rendered is directly proportional to the dependence of the marginal efficiency of capital; the added value added is directly proportional to the dependence of the volume of consumption and the value of adjusted income; the amount of transfer payments is directly proportional to the degree of price level change. The level of absolutely low values typical to the personnel dynamic

abilities is reflected in the salaries, which are characterized by a fixed price of the services rendered; the volume of services rendered is determined by the constant value of reduced marginal propensity to consume; the added value is proportional to the cost value; the amount of transfer payments is directly proportional to the level of prices for services.

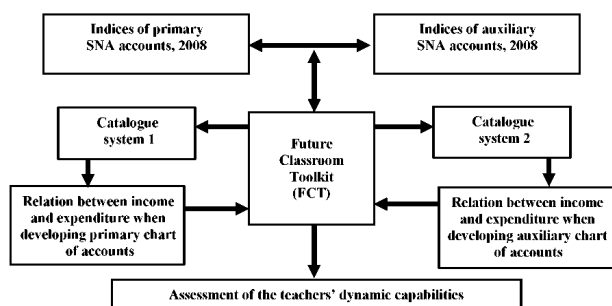
The above correlations allowed the authors to interpret the quantitative and qualitative characteristics of dynamic capabilities based on the assessment criteria offered by the UN standard. The values obtained by measuring the economic activity of competing counterparties, make it possible to determine not only the most important indicators established by the university administration as criteria for assessment of the teachers' dynamic capabilities (for example, the added value), but additional criteria as well, for instance, the ability to "live on credit"; maintaining balance between investments and savings; to ensure growth of autonomous costs, i.e. the increase in disposable income by an amount greater than the initial growth of income; differentiation between real and financial investments, etc.

III. RESEARCH RESULTS

The available updated auxiliary accounts [21.24], as well as software on the primary SNA accounts [22, P.1] allowed us to build a model for assessing the dynamic capabilities of the university staff in the context of the FCT (Fig.1).

Fig 1. Model for assessing the dynamic capabilities of university staff in the context of FCT

The model for assessing the dynamic capabilities of the university staff was developed on the bases of items of the primary and auxiliary accounts, and is characterized by two closed-loop schemes, which provide the possibility of continuous monitoring of the items of the traditional and auxiliary charts of SNA accounts under the conditions of constant changes in the applied FCT. It should be noted that the interrelation of these two closed-loop schemes, which influence the renewal of the system items, characterizes the degree of efficiency of the FCT use. In its turn, under the conditions of the SNA standard development, the FCT



influence on the assessment of the personnel activities provides the university administration with an effective electronic management tool.

IV. RESULTS AND DISCUSSION

The method used for development of the model for assessing the dynamic capabilities of the university staff in the context of FCT, which is described in this article, and which is reported in more details in the scientific paper "Perspective lines of research in the field of the theory and methodology of national accounts" was discussed at a meeting of the

Department of Political Economy of USEU in 2018. Also the results of studies were published in the article "The impact of changes in the market quality on the assessment of activities in the field of tourism", published in the Russian Journal of the Economic Theory # 3,2018, P.462-470.

V. CONCLUSIONS

1. The model for assessing the dynamic capabilities of the university personnel in the context of the FCT use shows that innovations in education should be considered in terms of their compatibility with the primary chart of the SNA accounts, namely, in terms of the formation of GDP.

2. The experiments with auxiliary accounts in the model of assessing the dynamic capabilities of the university staff determine the agenda and the priority areas of research in the field of the SNA theory and methodology under the conditions of digital economy.

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