development and implementation, their transparency and the ability to achieve higher results are very attractive.

## References

1. Klochkov A. (2010). *KPI i motivaztsyia personala [KPI and motivation of the personnel]*. Moscow: EKSMO [in Russian].

2. Padukhevich E. Tselesoobraznost ispolzovaniya sistemyi motivatsii na baze KPI dlya predpriyatiy agrobiznesa [The utility of the KPI-based motivation system for agricultural business companies]. Retrieved from https://uteka.ua/publication/agro-4-oplata-truda-i-kadry-v-sh-68-celesoobraznost-ispolzovaniya-sistemy-motivacii-na-baze-kpi-dlya-predpriyatij-agrobiznesa [in Russian.]

3. Polevaya M. Sistema stimulirovaniya prepodavateley vuza na osnove KPI [A system for stimulation of HEE lecturers on the basis of KPI]. Retrieved from https://fingazeta.ru/ekonomika/rossiyskaya_ekonomika/459490 [in Russian].

4. Samoilenko A. A. Osoblyvosti zastosuvannia KPI v systemi motyvatsii personalu na pidpryiemstvi [Specifics of KPI applications in a personnel motivation system of a company]. Retrieved from
http://www.economy.nayka.com.ua/?op=1&z=3030 [in Russian].

# IMPLEMENTATION OF STEM EDUCATION ELEMENTS IN TRAINING OF FUTURE STATISTICIANS IN THE CONDITIONS OF INFORMATIONAL AND EDUCATIONAL ENVIRONMENT

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Future statisticians acquire both technical and engineering skills and it is very important to provide modern teaching methods, a set of tools for their implementation is presented in the context of information and educational environment. Therefore, in the training of such professionals, it is important to develop an engineering mindset that can be ensured by the introduction of STEM technologies in an information and educational environment. Such kind of environment combines a wide variety of educational software and networking technologies, including e-mail, forums, sharing software, chats, video conferencing, audio and video recording, and a wide range of web-based learning tools [1].

STEM education involves sequential course or program of training that prepares job seekers for successful employment, requiring different and more technically sophisticated skills, including applying mathematical knowledge and scientific concepts [2]. The STEM acronym is used to refer to a popular line in education that encompasses science, technology,  and mathematics. This is an area of education in which the curriculum enhances the natural sciences component and

innovative technologies. The rapid evolution of technology leads to the soon to be the most popular and promising on the planet programmers, IT-specialists, statisticians, high-tech professionals. STEM develops capabilities for research, analytical work, experimentation and experimentation critical thinking [3].

The aim of higher education is to acquire a high level of scientific and / or creative artistic, professional and general competences required for pursuing a profession or field of expertise [4]. For example, in the context of the introduction of STEM elements of education in the preparation of future statisticians in the conditions of information and educational environment, it is necessary to execute a project to create a structural improvement of the computer graphics.

Future statisticians discusses project implementation results using STEM elements of education in an information and educational environment, presenting a presentation of their project and discuss the results during the online conference.

To implement the elements of STEM education in the conditions of information and educational environment it is appropriate to use the following scheme.

1. The choice of technological process. Drawings of the technological scheme.
2. Proposal for constructive implementation of a computer graphics that performs a certain stage of the technological process.
3. Calculation of the advanced element.
4. Drawings of an advanced element.
5. Creating a presentation and discuss the results during the online conference.

To use STEM education elements, it is necessary to formulate tasks in such a way that they contain the calculated, design, scientific components. A combination of an informational and educational and STEM environment provides the development of technical and informational competencies for future statisticians.

## References

1. Bykov, V. Ju. 2008. Models of organizational systems of open education. Kyiv: Atika, 684 p.

2. STEM-education in Ukraine: prospects of development. Retrieved from: Режим http://womo.ua/stem-obrazovaniev-ukraine-perspektivyi-razvitiya/

3. Shulikin, D. 2015. STEM-education: to prepare for innovations. *Education in Ukraine.* #26 (1437). P. 8-9.

4. Oliynik, V. V., Samoylenko, O. M., Batsurovska, I. V., Dotsenko, N. A. 2018. Formation of the professional competencies of future statisticians in computer oriented environment of higher education institution. Information technologies and learning tools. #68(6). P. 140-154.

# THE STATISTICAL CHALLENGES IN MEASURING THE DIGITAL ECONOMY

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**Abstract.** Digitalization is changing the economic activity, creating new products and services, and the growth of online transactions. It is creating new business models and processes, reshaping the traditional payment systems, and how goods and services are delivered and consumed. Digital technology has a significant impact on the economy in the last decade, transforming production processes and activities while generating benefits to society as a whole. It has empowered consumers to access a large variety of goods and services online. It has changed how the business operates and how consumers engage in a transaction with the business. Digital activities have become a significant contributor to economies around the world. Despite the rapid pace of change, there is little statistical information available that helps us understand the economic and social impacts of the digitalized world. This paper provides an overview of statistical challenges in measuring the digital economy.

## I. Introduction

There is no official or agreed definition of the digital economy. The term digital economy incorporates all economic activities enhanced by the use of digital inputs, including digital infrastructure, digital technologies, digital services, and data. It refers to all producers and consumers that are utilizing these digital inputs in their economic activities [1]. The International Monetary Fund (IMF) defines the digital economy as the use of digital transformation. There are many interpretations of the same term. The digital revolution has transformed our lives with unprecedented speed, providing immense opportunities as well as formidable challenges. With the rapid growth of the internet starting in the mid-1990s, digital activities started expanding and changed how the business operates, communicate, and perform everyday tasks. The changes associated with digitization result in the emergence of new occupations, and the decline or replacement of some jobs. The growth of electronic commerce (e-commerce) has been made possible by the expansion of access to computers, mobiles, and the internet in the home, workplace, and university. It is a mainstream channel for consumption, and products are moving from tangible mediums (books, CDs, games, teaching) to digital forms. Today we can buy books, clothes, jewellery, furniture, grocery, gadgets, and other products online. In the banking sector, the digital revolution has led to the introduction of new services such as internet banking, and mobile banking. It allows customers to access their accounts twenty-four hours a day and seven days a week. The impacts of digitalization can be seen in financial services, transportation, courier, retail, hotels, among many others. Customers now use