

Entrepreneurship in the Digital Economy Society: Pedagogical Aspects

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Abstract

The priority goal in the General education system is the formation of functional literacy of students. The ability and willingness to use knowledge, skills and abilities and, if necessary, find ways to solve problems, become a priority in the process of life. Among the main types of functional literacy, such as reading, mathematics, science, business literacy occupies a special place. The formation of students' entrepreneurial literacy includes the following stages: understanding entrepreneurship, participating in the entrepreneurial process, and learning to be an entrepreneur.

This requires not only the transfer of knowledge about business and management, but also the development of new ways of thinking, attitudes, competencies and behavior.

A significant proportion of secondary school students are interested in economic and entrepreneurial activities.

However, students have very superficial ideas about the essence of business activity, its organization, material and information support. In particular, this applies to business activities in a digital society. In this society, information itself becomes a commodity, and the price of any product is the sum of the price of material and information components. Moreover, the price of the latter can reach 70-90% of the total cost of the product. A feature of entrepreneurship in a digital society is the constant use of information and communication technologies, in particular technologies of the Fourth industrial revolution. These technologies include an intellectual component and represent a qualitatively new stage in the development of information and communication technologies. Of course, participation of students in real business projects is isolated and cannot be transferred to General education. It does not allow them to master all the subtleties of business activities necessary for the formation of professional competencies. The creation and use of "virtual" economic structures that have all the main features of real economic structures in many ways contributes to the solution of this problem. Such structures can be implemented as a role-playing game played by a team of students. The goal of this game is to create a "company" model for creating a specific product or providing popular services. In the process of implementing virtual business activities, it is possible to use a computer and computer modeling. The article presents a methodological implementation of the above approach in the form of a scheme of project activities focused on the creation and development of a specific "company" that produces selected products.

Keywords ¹

Entrepreneurship, digital economy, digital technologies, model, virtuality.

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1. Introduction

Information and communication technologies (ICTs) are the ideological core of modern society. Meanwhile, the ICT sector itself is very mobile and open to various innovations. Radical changes have taken place in it in recent years, when a new technological paradigm entered the arena, which was called the Fourth industrial revolution.

This situation was recorded and discussed at the world economic forum in Davos in 2016 [11], [13]. The Fourth industrial revolution brought together fundamentally new technologies that, according to our analysts, will radically change human civilization in the nearest future. The time frame for the impact of these technologies on social and economic processes is also uncertain. Nevertheless, today it is already clear that the Fourth technological revolution has a global character and it can be stated that humanity, as a whole, has moved to a new stage of its technological and social development [15], [16].

Information and communication technologies are an integral component of economic activity today. Technologies of the Fourth industrial revolution open up new opportunities for the economic sphere, but at the same time create new risks. These technologies are qualitatively different from the already familiar information and communication technologies. To emphasize this new quality, a new term "digital technologies" is introduced [3], [5]. A common feature of digital technologies of the Fourth industrial revolution is the presence of an intelligent component. Only with the help of intelligent technologies it has become possible to process the most important information for the economy (Big Data).

The development of business activity cannot be carried out without the development of modern information (and now digital technologies). On the other hand, mastering the basics of entrepreneurship in a digital society is one of the tasks of modern education. In this regard, there is a need for a methodological tool that could simultaneously master the basics of entrepreneurship, using digital technologies.

2. Purpose and objectives of the research

To substantiate and formulate a methodological approach to the formation of knowledge, skills and competencies of secondary school students related to business activities in society based on virtual modeling of economic activity; present it as a structure of students' project activities to create a virtual "firm".

In this case, you must:

- define a methodological approach to the simultaneous development of the basics of entrepreneurship and the necessary digital technologies for it;
- answer the question: is it appropriate to use virtual economic structures as a methodological tool for students to learn the basics of entrepreneurship in the society of the digital economy?

3. Literature review

To carry out economic activity in the digital economy society, first of all, ICT competence is necessary (and today digital competence is also needed). ICT competence (digital competence) implies not only the development of digital technologies (3D printing, technologies for creating mental maps, etc.), but also the ability to find and analyze the necessary data, transform it into information and, based on system analysis, transform it into knowledge (E. V. Mindzayeva, M. I. Shutikova, etc., [3]). One of the most important competencies necessary for the successful implementation of economic activities in a digital society is the ability to make decisions in conditions of uncertainty (K. Schwab, [11]) and others.

Decision-making activities combine different types of activities: analysis, modeling, interpretation, etc. The decision-making process plays a key role in economic activity in a digital society. At the same time, we are talking about open systems that function according to the law of nonlinear

dynamics (S. D. Karakozov, N. I. Ryzhova, [6]). Such dynamics is closely related to the development of the phenomenon of "Big data" (B. Schmarzo [8], etc.). This feature of the digital society was one of the reasons for the emergence of technologies with elements of artificial intelligence (T. S. Shihnabieva [10], V. I. Serdyukov [9], etc.).

4. Methodology

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Decision - making activities combine different types of activities: analysis, modeling, interpretation, etc. The decision-making process plays a key role in economic activity in a digital society. At the same time, we are talking about open systems that function according to the law of nonlinear dynamics (S. D. Karakozov, N. I. Ryzhova [6], etc.). The appearance of such dynamics is closely related to the appearance and development of the phenomenon of "Big data" (B. Schmarzo [8], etc.). This feature of the digital society was one of the reasons for the emergence of technologies with elements of artificial intelligence (T. S. Shihnabieva [10], V. I. Serdyukov [9], etc.).

5. Results

Currently, elements of economic knowledge are included in the content of various General education disciplines. However, the effectiveness of this content is not great, since it is not supported by adequate educational activities.

The proposed methodological approach gets into the context of project activities of students - the creation and development of virtual "firms", which allows students to go through the entire cycle of entrepreneurial activity independently [12].

The experience shows that this approach has significant advantages over traditional forms of education. In particular, a significant disadvantage of such forms is the weak implementation of the integrative principle inherent in real economic activity. Each educational discipline that students master contributes to the formation of their professional competencies. However, this does not always lead to the formation of a unified view of the essence of economic phenomena. In other words, in this case, it is not possible to demonstrate the principle of emergence, which is fundamental for the theory of systems - the properties of the whole may not consist of the properties of its constituent parts [1], [7]. To achieve the desired educational effect, it is necessary to fundamentally change the approach to learning. This is the goal and serves as a methodological approach aimed at creating a simulation model "virtual firm" [8], [9].

This approach is based on the assumption that project activities and the full cycle of problem solving allow you to carry out educational activities that are inherently close to real economic activity.

One of the innovative aspects in the implementation of this model is the technology of additional reality (AR), which allows you to link a virtual object to any point in space. The use of such technologies can lead to significant pedagogical effects.

The content of training in the framework of the "Virtual firm" project should be built along three content lines:

- basics of office management;
- business planning;
- financial activities of the company;
- marketing and advertising.

In addition to the actual economic component, a significant role is played by the development of information and digital technologies, without which the activity of a modern economist is unthinkable. In particular, it is advisable to draw up and implement a business plan using Gantt charts and their free computer implementation Ganttproject. This program allows you to create visual business plans and manage project activities. If the business plan needs to take into account the resource support of the project, you can use the Project Expert program.

No less important component of the content of the project "Virtual firm" are the tasks. At the same time, the tasks that economists solve are methodically divided into two components:

- tasks for the calculation;
- tasks that do not require calculations.

In all cases, the solution of problems is carried out according to a certain universal scheme (S. A. Beshenkov, M. I. Shutikova, etc.) [4]. [14]:

- problem statement in a meaningful way;
- select or create models that refine and specify condition of the task;
- selecting or creating a method for solving the problem;
- select the model presentation form;
- implementation of the chosen method of solving the problem, including using software environments;
- interpretation of the results obtained and, if necessary, correction of previous stages;
- the use of results in economic activity.

The project "virtual firm" suggests that students will learn the basic economic concepts, learn the formulas used in the operation of the business and banking transactions; receive certain skills of work with software of economic activities.

It is necessary to emphasize the following fact. Digital technologies can significantly facilitate the work of an economist, performing a significant part of the routine work for him. On the one hand, manual execution of this "routine" is a necessary part of true professionalism. The "Virtual firm" project focuses on both the development of digital technologies and traditional "routine" content for the economy and business using simple information technologies.

On the other hand, digital technologies are not only a tool for economic and entrepreneurial activity – they actually form a new type of economy – the digital economy, where information becomes the main resource (even now, the cost of goods is 70-80% determined by the digital component). In this regard, one of the main goals of the virtual firm project is to give students an idea of the integrated nature of the economic and digital components of modern society.

Table 1

The general structure of the Virtual Company project

Project stage	Questions under study	Digital resources	Knowledge and skills to be formed	Concepts in use
1	2	3	4	5
The choice of an operations area, product and competitive strategy. The company's public image.	<i>Economic knowledge:</i> Entrepreneurial idea. Creation of the company logo. Sales market analysis. Financial plan. Possible problems of the production process. Determining the price of goods. Drawing up a financial plan. Identification of funding sources. Choice of a business ownership structure. Creation of	Graphic and text editors. Scanning software for graphic images. [1] Project Expert is a program for developing business plans and evaluating investment projects.	Acquaintance with the psychological characteristics of the perception of color, shape, location of graphic objects. The ability to develop the company style reflecting a particular activity and promoting its positive image. The ability to find the desired information.	Perception of information, forms of presentation of information. Goods differentiation. Company trade mark. Logo. Brand block, company tag line. Company style. The essence of an entrepreneurial

Project stage	Questions under study	Digital resources	Knowledge and skills to be formed	Concepts in use
	departments and distribution of responsibilities. Sources of supply and pricing. Manufacturing control. <i>Accounting.</i> Cash book and book of banking operations. Periodic reports. Initial and final balance. <i>Knowledge and skills in the field of information technology</i> Methods of presenting graphic information. Creation of drawings. Image editing. Combination of graphics and text. Multimedia applications.			secret.
Organization of company workflow.	Rules for paperwork. Working with templates. Creation of standard documents. Inserting a picture into a document. Installation of software. Sending documents over a network. Digitalization of documents. Automatic translation of documents into other languages using CAT software. Printing and reproduction of documents.	Text and image editors. Translation software. E-mail. Scanning and text recognition software.	Knowledge of the peculiarities in the wording of official documents and documents of a personal nature, generally accepted abbreviations of words. The ability to make samples of standard documents. Knowledge of the rules of business communication when using telecommunications. Information security.	Document flow. Forms of the presentation of business information. Organizational and administrative documents. Letterhead. Essential details of a document. Workflow methods. Means of communication and information exchange. Business correspondence. Internal and external environment of entrepreneurship.
Advertising the company, its goods, services.	Creation of static and dynamic images. Viewing a video. Saving an image. Creation of multimedia computer presentations. Interactive presentations Giving presentations. Creating multimedia	Cloud services (cloud presentation on Prezi, etc.). Text editors. Browsers.	Familiarity with the ergonomic requirements for placing information on screen and paper documents. The ability to make comments on a video. The ability to justify the effectiveness of the created video in terms of goals. Skills in creating hypertext	Human perception of information. Advertising. Types of advertising (image advertising, promotional advertising, sustainability

Project stage	Questions under study	Digital resources	Knowledge and skills to be formed	Concepts in use
	documents. Web site development.		documents.	advertising). Information support of product promotion on the market. Advertising campaign. Search for information according to specified criteria. Request for retrieval from information systems. Search engines.
Planning the company activities.	Information models. Formalization of problem conditions. Project planning with Gantt charts. The study of information models by means of spreadsheets.	Spreadsheets. Text editors. Project Expert Software: https://www.expert-systems.com/financial/pe/ GanttProject App	The ability to present information in tabular form, to make calculations and analyze the results.	Optimization. Criteria for optimality. Acceptable and optimal solutions. Target function. Extrema of the objective function. Gantt chart.
Market analysis.	The construction of structures reflecting the movement of goods and information: graphs, charts, smart charts, "Chernoff faces."	Smart chart plotting apps	Knowledge of the types of business graphics and the peculiarities of their use. The ability to use market analysis methodologies based on "Chernoff faces". The ability to analyze information presented as a smart chart.	Demand. The function of demand. Offer. The function of offer. Market equilibrium. Supply and demand model. Business graphics. Smart charts. Chernoff faces
Assessment of the company performance.	Built-in functions of spreadsheets (financial, statistical, mathematical). Solving equations, inequalities, systems of equations and inequalities in Excel spreadsheets.	Spreadsheets	The ability to assess the calculation results and draw conclusions about the company profitability, the best option for investing capital, financial risk – from the analysis of information presented in different forms (numerical, graphic, tabular). The ability to justify one's choice.	Relational tables. Essential details. Indicators. Data processing methods. Performance criteria. Cost price. Performance. Profitability. Tax rates. Average values. Deviations of average values. Interest rates of banks. Simple and compound interest formulas. Loans. Correlation.

Project stage	Questions under study	Digital resources	Knowledge and skills to be formed	Concepts in use
Financial reporting.	Creating databases using spreadsheets and databases. Different ways to organize data. Database information retrieval. Data archiving.	Spreadsheets. Archivers.	The ability to create tables, queries, generate reports based thereon. Familiarity with the types of business reports and the rules for their design.	Database. Types of databases. Relational databases. Forms of business reports.

6. Discussion

The main goal of the virtual firm project is to provide a detailed view of economic and information activities that are linked to it. This integration is typical of modern digital society and the digital economy. The tool for solving this problem is simulation as a development of the ideas of the classical contextual approach. It seems to us that this approach is original when applied to the theory and practice of teaching subjects of the economic and information cycles. World experience shows that simulation is one of the most popular tools for solving a wide variety of tasks in various fields. However, this method has not yet fully taken root in education, although it is the competence approach that opens up a wide field for the application of this method.

7. Conclusion

It was found that the problem of mastering the basics of economic and entrepreneurial activity together with the development of information and communication technologies (as well as digital technologies of the Fourth industrial revolution) is relevant in the transition to a digital economy society.

Specified and updated system of concepts related to entrepreneurial activity in the digital society: expanded the content of the concept of information as fundamental categories reflecting a wide range of aspects of reality; information processes in the social, economic, and technical systems that are converted, stored and transmitted information; on information systems, under which information processes; about information models that reflect certain aspects of the implementation of information and economic processes in society, about the properties of information that are important from the point of view of management in society and technology.

The ways of integrated formation of the foundations of entrepreneurship and digital technologies in the digital society based on the virtual model of entrepreneurial activity implemented in the course of the project "Virtual firm" are revealed.

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