

# Modern Information Technologies in the Organization of Inclusive Education

Egorchenko T.I. Bogdanova J.A. Bogomolova E.A. Roshchina Yu.V.

*V.I. Vernadsky Crimean Federal University, Simferopol, Russia*  
*\*Corresponding author. Email: egortatyana@mail.ru*

## ABSTRACT

In modern times of education development, it's high on the agenda to improve its quality for all students in accordance with their special needs. And the pressing challenge here is the provision of inclusive education for successful socialization and effective self-actualization in professional activities. The application of inclusive education defines the latest innovative modern forms of study and helps to overcome communication barriers. The article describes the problems of teaching methods of accounting information disciplines, including students with disabilities. Computer programs used for this type of study are considered. Problem areas of inclusive teaching of accounting information disciplines are revealed. Challenges are explored and ways to address the organization of inclusive teaching are proposed. The ways of using the possibility of fully remote online education with the help of the current state of the art and technologies allow you to organize inclusive education in almost all profiles of the field of Economics. The ways of involving students with disabilities in the scientific activities of the university, as well as the search for solutions to these issues are revealed.

**Keywords:** *higher education, information technologies, limited health capacity, inclusive education, vocational education, program*

## 1. INTRODUCTION

The problem of higher education generally, and economic education specifically, has many aspects. While science education is less subject to change due to social dynamics, most the humanities respond to the challenges of social development in the most direct way. To a large measure, this also applies to economic education. These days the problem of teaching methods of economic disciplines, including students with disabilities, is becoming more and more urgent in Russia. We are witnessing the reform of the higher education system. Now it is obvious that the economy of the Russian Federation has already passed a certain path of development. Some Russian enterprises inevitably become total or partial ownership of foreign companies, and a large number of them are able to raise capital in the world markets. Accordingly, the same issues become relevant for Russian business as for entrepreneurs and managers in developed countries. Among these issues are implementation in the economic practice of information technologies and program systems for automation not only and not so much traditional accounting, but, first of all, the process of supply, manufacture, logistics, that is all that makes the basic activity of the enterprise. There is a need to train specialists (economists, accountants) not only within the framework of a traditional understanding of their specialty, initially associated with the preparation of financial and statistical accounting and tax calculation but also capable

of using modern information technologies, which are increasingly being implemented at enterprises and organizations in Russia. It is understood that the given specialties and scope of activity are accessible enough for invalids, handicapped people that demands urgent reorganization of the educational process as a whole, and in a direction of preparation "Economics", in particular, for the purpose of increase of its availability for the given groups of applicants.

At the present day an expert in the field of finance, economy, accounting, and audit shall have an understanding about bases of construction and functioning of the automated information systems of accounting, analysis, and audit; to understand his or her role at all stages of the life cycle of the automated information system of accounting. In order to take a correct view, select, and effectively use software tools in practice, he or she must focus on the huge market of information products for accounting, analysis, and audit. An accountant must have the technology of accounting in a computer software environment.

Thus, the aim of this article is to identify problem areas of inclusive teaching of accounting information disciplines, ways to involve students with disabilities in the scientific activities of the university, as well as search for options to address these problem areas.

## 2. METHODOLOGY AND TECHNIQUES

Discoursal and conceptual approaches to the problem areas under discussion served as the methodological framework for the article. General scientific methods were used: comparative and systematic structural analysis, synthesis, generalization, comparative method. Data from the Information and Methodological Support Portal for Inclusive Higher Education was analyzed [1].

## 3. RESEARCH RESULTS

The Ministry of Education and Science of the Russian Federation a while back set out to bring the number of universities providing educational services to people with disabilities to 160 by 2020. Also, according to the state program "Accessible Environment" for 2011-2020, prepared by the Ministry of Labor and Social Protection [2], the availability of conditions for quality education of invalids and people with disabilities in higher education institutions from 2016 is a mandatory parameter in assessing the effectiveness of university. This approach suggests that providing conditions for the education of people with disabilities is becoming one of the main requirements for the development of higher education institutions. An accessible environment significantly affects the competitiveness of a modern university. University, which does not have conditions for teaching disabled people, loses its credibility and losing the fight for the entrant. This approach requires a reorganization of the educational environment, including adaptation to the needs of special students, both in terms of learning conditions and educational programs. The use of information technology helps to solve these problems in some way.

It should be noted that in recent years study materials have appeared focused on the teaching of information systems in the field of economics, accounting, and audit. These are authors such as Golitsyna O. L. [3], Utkin V. B. [4], Chistov D. V. [5], numerous literature by 1C firm, and also by other manufacturers of specialized software. Issues discussed in study guides by different authors are approximately the same: these are the basis for the construction and use of information systems of accounting, general classification, and advanced treatment of the most common ones in the Russian Federation. Let's consider the main information systems existing at the moment.

Nowadays the most pressing for Russian enterprises are such concepts of information systems as MRP II and ERP, which have actually become world standards. They are sets of common rules formulated in the early 80's and 90's by the American Society for Production and Inventory Management, which brings together leading American companies. According to these rules, planning and control of different stages of the production process can be carried out: specification of the raw materials requirements, reclamation, capacity utilization, resource allocation, etc. Over the last 30 years, these concepts have become the

main business model used by manufacturers to achieve production efficiency [3]. Modern automated systems of organization and logistics of production root down to MRP material requirements planning systems. ERP-systems make it possible to track not only production but also other resources of the enterprise (financial, sales, etc.). The concept is more functional, with a strong focus on finance and decision support tools. It provides the ability to plan and manage not only the production processes but also all activities of the company, to achieve its optimization in terms of resources and time. The standard functions of an ERP-class software product are:

- forecasting, business and financial planning;
- sales management;
- production scheduling;
- product structure management;
- inventory management;
- planning for material requirements and production assets;
- production management;
- supply;
- finance/accountancy;
- financial analysis;
- personnel management and time tracking.

Set of specific modules to implement these functions can be different. In any case, three basic blocks should be clearly distinguished in an ERP-class system: the formation of a master plan, planning needs, operational management [4].

## 4. DISCUSSION OF RESULTS

These days Russian and Western products are present on the domestic market of ERP- and systems close to them. Western (SAP, Oracle, Microsoft, IFS) and Russian ("1C", "Parus", "Galaktika") developers mainly work through trading partners. Basically, the market of enterprise resource planning systems is represented by two price tiers: expensive Western and cheap Russian developments. The price difference represents the quality of products and, accordingly, differences in labor costs for their development. In addition, the cost of ERP products directly depends on their capability and customer needs. Thus, software products of "1C" are considered as a "kit" on which basis it is possible to automate separate business processes. The ability to gradually automate particular areas of enterprise management has caused popularity and wide circulation of software products of "1C" [5].

Thus, the need of training specialists with knowledge of various modules of "IC" is becoming apparent. The difficulty of teaching such disciplines in general and students with disabilities, in particular, has two components.

Firstly, it is necessary to have sufficient material and technical resources of the educational institution, since the software products have rather high requirements for the parameters of computer equipment. This may also include the need for competent educational support staff to be able to monitor the health and, if necessary, restore the working condition of computer equipment. Work of the software product, as a rule, is accompanied by the firm delivering it, and, in case of failure in the program work, specialists of the supplying firm eliminate it.

Secondly, computer skills and physical abilities of students determine the great, if not decisive, importance in organizing the process of teaching information disciplines, in the ability to perceive and absorb material. If one student takes 20 minutes to complete a task and another student does not have enough 1 hour and 20 minutes to complete it, then a normal, full educational class is not possible. While in a typical seminar class or training session the speed at which students perceive and record information is approximately the same, in a computerized laboratory the speed at which they type on the keyboard, knowing the purpose of special keys, etc. is often the decisive factor. The level of students' competence depends on many factors, ranging from having a computer at home to having or not having knowledge of a basic discipline (in the case of accounting software - accounting).

Since it is not possible to influence the state of material and technical resources of the university, and moreover on the competence of educational support staff, the teacher of information accounting disciplines should pay all attention to increase of students' perception of taught disciplines, as well as search for new ways and methods of teaching for students with special needs. At this point, the teaching method chosen by the teacher that reflects the specifics of the subject comes to the fore. Therefore, the development of lecture and educational learning material becomes the teacher's primary task. Moreover, the tasks should be designed in such a way that students with high computer skills and without physical limitations would be interested and able to perform them with minimal help and participation of the teacher, and students with low computer skills and difficulties when working with the mouse and keyboard, with increased attention to them, the teacher could cope with the task at a set time. In addition, it is to be wished, if not necessary, that both receive satisfaction from the work done. In computer labs, students most often work with pleasure if they understand what they are doing and why they need it. It is especially exciting when they get any generalized result of the work done and realize that this is the right result. Compiling such tasks is a complex and time-consuming process. However, this list of problems is not exhaustive, each of the components has its own several problem aspects and solutions, which are presented in Table 1.

**Table 1** Challenges and ways to address inclusive teaching

<b>Challenges of inclusive teaching of economic information disciplines</b>		<b>Addressing</b>
Material and technical resources of the educational institution	Licensed software availability	Reimbursement and subsidized provision of software for inclusive education institutions
		Organization of direct cooperation with producers and distributors of specialized software products
	Availability of computer labs equipped to meet the special needs of students	Getting targeted financing
		Applying to specialized funds
		Remote access organization
	Availability of specially equipped free access to the educational institution, to the classroom	Organization of online learning
Organization of webinars		
Cooperation with business		
Students with disabilities	Problems with visual perception of information	Using a special keyboard
	Problems with hearing perception of information	Support of educational process by specialists - sign language interpreters
	Problems with keyboard operation	Use of special input aids
	Problems with being in the classroom	Application of remote access means Online learning

As Table 1 shows, solving almost all problems, especially the logistics of the process, requires significant financial investments. However, it should be noted that some problems, both material and limiting, can be solved using modern information technologies. Thus, the use of remote access to educational information databases can solve the problems of the impossibility of student's presence in the classroom, both during the whole period of studying and during the disease exacerbation.

Using the possibility of fully remote online education with the help of the current state of the art and technologies allow you to organize inclusive education in almost all profiles of the field of Economics. We find it particularly promising and interesting to create and use in work video courses and video lessons that can be given to students with special needs for homeschooling, or used in the organization of their online learning. The second option seems to be more effective since it preserves the possibility of direct contact with the teacher on all issues that arise in the course of learning.

Particular attention needs the organization of research work of students with disabilities, as an integral part of the educational process at a higher education institution, require separate consideration.

A research work of students is a continuation and improvement of the educational process and is organized directly at the departments. Basis for the research work organization of students is research work, which is carried out by the faculty of the department and the composition of disciplines taught by teachers of the department. This type of activity provides for the implementation of elements of independent research work in the chosen field. Such work is carried out both directly in the learning process and during extra-curricular activities. The research work of students included in the educational process may take the following forms:

- laboratory work, homework, term papers, and graduation works containing elements of scientific research;
- introduction of elements of scientific research into training sessions and seminar classes;
- performance of tasks of research character in the period of productive and pre-diploma practices;
- participation in student research seminars.

Research work of students, included in the plan of study of specialties, is mandatory for all students, its purpose is to spread and improve the knowledge of students in the field of scientific research on the problems of the relevant discipline. This involves the introduction of elements of research in laboratory practicum, seminar classes, term and diploma design, as well as the study of a special course on the basics of organizing and conducting research with a particular research specialization. Research work of students performed during extracurricular time may include the following forms:

- work in students' scientific circles in certain disciplines of the department;
- participation in scientific student competitions;
- participation in scientific student conferences;
- participation in the performance of the department's state budget and contractual topics.

The forms and methods of students' research work depend on student quality. Lower division is dominated by such forms as writing essays, performing calculations, translating literature, etc. At upper division - real term and diploma design, participation in preparation and carrying out of scientific experiments, performance of contractual scientific and research works.

This approach is typical for the organization of research work of students in most fields of education. However, it should be borne in mind that the teaching of accounting at present times shall not be limited to the study of accounting theory, financial and management accounting in their classical sense, with students familiarizing themselves with paper primary documents. The work of a modern accountant, analyst, economist requires not only knowledge of basic subjects and modern legislation, but also deep mastery of appropriate computer programs. This is due to the general computerization not only of accounting, as such, but also to the automation of relations between enterprises among themselves, with the budget, as well as the state tax administration.

In this regard, when organizing the educational process, special attention should be paid to the research work of students in the field of information technology. However, in contrast to research in the field of theoretical economic knowledge, research work related to information accounting disciplines has a number of key features and differences. Research of students in this direction assumes:

- a sufficient level of knowledge in basic disciplines (financial accounting, audit, tax accounting, etc.);
- a sufficient computer skill and experience;
- knowledge of specialized software products at a level sufficient for their critical review and comparative analysis;
- knowledge of legislative base in the sphere of accounting and taxation;
- an ability to analyze special literature of professional orientation.

Thus, the organization of research work requires not only the desire of the student to study and engage in research, but also the creation of certain conditions for the possibility of development in this direction. The main condition, in this case, is free access of students to existing software products for the purpose of comparative analysis,

critical score and justification of scientific conclusions. It is not enough just to have a software product in the appropriate classroom of the university, it is necessary to update it regularly, bringing it in line with the constantly changing legislative and regulatory framework, as well as the availability of modern computer technology. It should also be noted that research work of students in the study of accounting information requires the free access of the students to the software products, and this, accordingly, is connected with necessity of allocation of additional time during the university laboratories, as well as with the possible risk of damaging not only the programs but the computer in general. Fulfillment of these conditions requires certain material, financial expenses, and additional time spent by the academic advisor.

Current situation of the need to meet the requirements of the time is a favorable factor that helps to make educational and scientific activities more accessible to students with special needs since it allows you to organize remotely both the implementation of the research itself and monitoring of this activity. Especially promising is the organization of scientific work of students with special needs using videoconferencing, during which students with almost any type of health conditions and limitations can take an active part in the work.

Considering these problems, nowadays the most real possibility for scientific work in the field of information accounting disciplines is studying and analysis of software products used by the enterprise within the framework of the performance of the diploma work and pre-diploma practice. At the same time, students have the opportunity to see the practical application of the software products studied, the level of automation of accounting work at the enterprise, as well as possible disadvantages and inconveniences in the application of the program depending on the scope of the enterprise, the number of its employees and the amount of work performed.

Such experience is indispensable at the comparative analysis of various software products on automation of accounting and management accounting. However, in this case, students are limited in their ability to make changes in the form of accounting at the enterprise under analysis, to implement new approaches and ideas, as well as to reliably assess the economic effect of implementing their scientific developments.

Also, the key feature of research work in the field of accounting disciplines is strict regulation of forms and methods of accounting at the legislative, methodological, and regulatory level. This introduces certain limitations to the subject of scientific work not only in the study of information accounting disciplines but also in the field of accounting theory, financial accounting, taxation, etc. In this connection to the main directions of research work of students, in which the most real and productive work is possible, should be attributed:

- automation with the use of the most common accounting software products (1C: Accounting, Galaktika, Parus, etc.) of the main sections of accounting;

- automation using the most common accounting software products (1C: Accounting, Galaktika, Parus, etc.) trade and settlement operations;
- analysis of possibilities of adaptation of software products to new requirements of legislative and regulatory documents;
- analysis of the economic effect from the introduction of software products.

The situation of inclusion in higher education institutions is now changing steadily for the better. According to the information on the Methodological Support Portal for Inclusive Higher Education in Russia, there are 1124 universities that recruit applicants with disabilities in 15 fields of training [1]. Among them, 476 universities train specialists in economics and accounting.

## 5. CONCLUSION

In this regard, it should be borne in mind that the use of certain software products makes it possible to develop and implement various reporting and summary forms, thus defining the type of accounting documents provided to external and internal users. Therefore, the scientific work of students can be directed to improve existing and develop new analytical forms, allowing to provide users with the most complete and reliable information about the financial condition of the enterprise.

This approach will prevent the student's research work from going beyond the legal field and will provide their creative potential with the possibility of practical implementation and obtaining an economic effect.

## REFERENCES

- [1] Portal informatsionnoy i metodicheskoy podderzhki inklyuzivnogo vysshego obrazovaniya. Available at: [https:// wil.ru](https://wil.ru).
- [2] Gosudarstvennaya programma Rossiyskoy Federatsii «Dostupnaya sreda» na 2011– 2020 gg. // Ministerstvo truda i sotsial'noy zashchity. Available at: <http://www.rosmintrud.ru/ministry/programms/3/0>.
- [3] Golitsyna, O.L. Informatsionnyye sistemy: Uchebnoye posobiye / O.L. Golitsyna, N.V. Maksimov, I.I. Popov. - M.: Forum, 2016. - 352 c.
- [4] Utkin, V.B. Informatsionnyye sistemy v ekonomike / V.B. Utkin. - M.: Academia, 2018. - 189 c.
- [5] Chistov, D.V. Informatsionnyye sistemy v ekonomike: Uchebnoye posobiye / D.V. Chistov. - M.: Infra-M, 2019. - 248 c.
- [6] Reznik G.A. Razvitiye inklyuzivnogo obrazovaniya v vuzakh Rossii / G.A. Reznik, M.A.

Kurdova./ «*Ekonomika i sotsium*» №11(30) 2016.  
Available at: [www.iupr.ru](http://www.iupr.ru)

[7] Mikhal'chi Ye.V. Sostoyaniye inklyuzivnogo obrazovaniya v sisteme vysshego obrazovaniya v Rossii. [Elektronnyy resurs]: *Sovremennyye problemy nauki i obrazovaniya*. – 2014. – №2. Available at: <http://www.scienceeducation.ru/116-12445>.

[8] Ministerstvo nauki i vysshego obrazovaniya Rossiyskoy Federatsii. Available at: <https://minobrnauki.gov.ru>.

[9] Inclusive education for learners with disabilities // *Petitions*. European Agency, 2017. Policy Department C: Citizens' Rights and Constitutional Affairs. Available at: <http://www.europarl.europa.eu/supporting-analyses>

[10] Inclusive education for learners with disabilities // *European Parliament Committees*. Available at: <http://www.europarl.europa.eu/committees/en/supporting-analyses-search.html>