The Usage of Automated Information Systems for Database Management in General Secondary Education Institutions of Ukraine

Tetiana Kravchynska[1], Oksana Dubinina[2], Krystyna Chałas[3], Tetiana Burlaenko[4], Anna Tymoshko[5], Olena Sholokh[6], Alla Vinichenko[7]

[1]University of Education Management, Kyiv, Ukraine
[2]University of Education Management, Kyiv, Ukraine
[3]The John Paul II Catholic University of Lublin, Lublin, Poland
[4]University of Education Management, Kyiv, Ukraine
[5]University of Education Management, Kyiv, Ukraine
[6]Taras Shevchenko National University "Chernihiv Collegium" Chernihiv, Ukraine
[7]University of Education Management, Kyiv, Ukraine

Abstract
The article presents the results of research obtained in general secondary education institutions (hereinafter – GSEI) of Ukraine. Processes of creation, receipt, processing and submission of information to the end consumer are substantiated and practically verified, namely, the system of information quality assurance of education quality management in the general secondary education institutions is methodologically substantiated. Presented results of a survey of 360 respondents, namely: regarding sources of internal information development in general secondary education institutions; on forms of accounting and storage of external information in general secondary education institutions; study of methods and means of processing external management information; study of forms of management decisions developed on the base of external socio-pedagogical information; understanding of the essence of the concept of "information support of quality management of education in general secondary education institutions" by heads of general secondary education institutions. Also, in accordance with current events around the world (COVID-19 pandemic), we conducted an additional survey (88 students) and added the results of a survey of respondents to identify problems with the quality of information support of the educational process in general secondary education.

Keywords: *information processes, automated control system, quality of education, management information support.*

1. Introduction

The entry of the world community into the era of globalization and digitization of society, the advance of information resources development and management systems, the updating of information technologies require the constant development of educational and management modernization.

The accumulation of unstructured information, its overload in educational institutions, led to the emergence of spontaneous information flows and resources, positioned the urgent need for competent management of the information support process, as one of the effective vectors for improving the quality of educational services, which is decisive and confirms the relevance of our research.

Under such circumstances, it is necessary to analyze, systematize and summarize the scientific and practical results obtained on the problem of educational quality management in a general secondary education institution (GSEI) through the prism of the usage of information technologies.

2. Literature Review

The profound social and economic shifts that have taken place in Ukraine have prompted a revision of management studies, an appeal to the global experience of countries that exist in market conditions, and a tremendous amount of management experience. Results of pedagogical researches of many scientists testify that under modern conditions of managing of educational institutions become a professional activity. Its content goes beyond the pedagogical knowledge, it requires mastery of pedagogical management, interdisciplinary knowledge and skills (Tymoshko, 2019).

The components of the system of information support in educational institutions (EI) and the readiness of the heads of the EI for quality management of this process are investigated in the scientific achievements of domestic scientists (L. Kalinina (2008), L. Zabrodska (2002)). The analysis of the scientific literature has allowed us to establish that the majority of research on the problem of organization of educational ensuring quality in the GSEI was carried out in pedagogy from the standpoint of school studies and educational management (V. Maslov (2006), O. Savchenko (2001, 2010)). Problems of the usage of informational systems and technologies in the organization of monitoring of the educational quality were analyzed by V. Bykov (2009), L. Kalinina (2008), L. Kartashova (2017,

Manuscript received May 5, 2022
Manuscript revised May 20, 2022
https://doi.org/10.22937/IJCSNS.2022.22.5.69

2020) et al.

Ukrainian researcher B. Zhebrovskyi conducted the research, in which the role of the Head of the GSEI on ensuring quality of the educational process was studied, the domestic and foreign experience of management activity of the director was analyzed regarding his professional readiness to provide quality school education; a system model for forming the future school director's professional readiness to manage the quality of education has been developed and theoretically substantiated (Zhebrovskyi, 2021). This approach allows us to predict a new level of solving the problem of managing the development of the teaching staff using ICT, which we consider from the position of a competent leader in the context of educational transformation.

In addition, the experience of ICT implementation was studied on the example of Hungarian schools (Buda, 2020).

Considered the use of information technology throughout life and readiness for lifelong learning as an indicator of professional success and to ensure the continuous self-development of each person, without age restrictions, in the context of rapid digital progress (Poplavskyi, Bondar, 2021).

We have studied the development of digital competence of teachers and based on the research of scientists we note that most teachers have only a basic level of digital competence today; digital activity and age are key indicators of teachers' information skills; teachers need strong digital skills for future learning (Zhao, Llorente, Gomez, 2021; Saikkonen, Kaarakainen, 2021; Howard, Tondeur, Ma, et al., 2021).

Various tendencies of building a model of information and communication support for quality management of education on the example of a modern preschool institution in accordance with International Educational Standards were considered. But we share the opinion of authors that "building a model of information and communication support for quality management of education of a modern educational institution and methods of assessing the levels of information support for quality management of education" is seen as a process that results in: a) providing managers with the information necessary to make effective management decisions; b) management of the quality of education in the educational institution is an intermediate – final result, which, according to the research problem, should be in a causal relationship" (Kosenchuk, Bakhmat, 2019).

We also further examined the impact of the pandemic on the quality of education. The COVID-19 pandemic has provoked an educational emergency of unprecedented proportions, and lack of education due to educational disruptions can have significant long-term consequences for the well-being of children throughout life (Reuge, Jenkins, Brossard, et al., 2021; Richmond, Bartell, Cho, et al., 2020).

3. Aims

The purpose of the research is to provide a scientific substantiation and practical verification of the information support system of educational quality management in the GSEI.

4. Research methods

The research under consideration has been carried as part of the scientific-practical study "Development of the information-analytical competence of the teacher in the conditions of transformational changes of society", headed by O. Dubinina, PhD of Pedagogical Sciences (copyright certificate № 93490 of 10/28/2019).

In the course of the research, a number of methods were used. It corresponds to the purpose of the research, namely: the theoretical (analysis of scientific and pedagogical and methodological literature; the analysis, the synthesis, the systematization of the content, forms and methods of organizing work with teaching staff of the GSEI, the generalization of the research results to determine modern approaches to information support for the educational quality management of the GSEI; the empirical methods (generalization of pedagogical experience, testing, observation, interviewing, questioning, discussing; observing the activities of the teaching staff of the GSEI, questioning of teachers, and school principals; modeling of different situations, methodological measures to substantiate the state of educational quality management of the GSEI of Kyiv using ICT); the experimental methods (pedagogical experiment, processing of research results in order to systematize research results and substantiation of modern approaches to information support in the educational quality management in the GSEI).

5. The results and discussion

We continue our research and will directly rely on our previous results and conclusions on information support for quality management of education in general secondary education institutions of Ukraine (Tymoshko, Dubinina, Kravchynska, et al., 2020).

An important direction of the educational management modernization, defined by the National Doctrine of Educational Development of Ukraine in the 21st Century, is the transition from operational to programmatic and targeted managing of educational institutions, which is provided with professional scientific and methodological support for the implementation of administrative decisions (National Doctrine, 2002). Creating an "optimal" information environment is a key task in the transition to the information society. The widespread introduction of ICT in the educational sphere prioritizes the problem of

computerization of GSHI. The development and implementation of ICTs are aimed at their comprehensive information, resource and methodological support (Kremin, Levovytsky, Ognevyuk, et al., 2013).

In her study, L. Zabrodska (2002) developed an algorithm for the technology of implementation of an information system for managing the educational process, which included the following steps:

- the analysis of pedagogical feasibility of implementing information management technology;
- the determination of the purpose of functioning;
- the determination of the composition of the functional tasks;
- the development of information and functional model of information system for educational process management;
- the development of information processes;
- the identification of the functional systems that are part of this system;
- the experimental verification;
- the analysis of implementation results;
- the evaluation of the effectiveness of the management information technology implementation;
- development of methodological recommendations for the principals of the GSEI on the integration of ICT into the educational process.

The school principal is delegated the authority to solve several management tasks at once. One of these is the development and implementation of an organizational structure for managing the process of informatization, that is, the formation of the educational environment. The educational environment of the GSEI has the several components, and some of them should be distinguished (Dubinina, Hrytsiak, 2019):

- the target component that defines the objectives of the institutional functioning and development;
- the managerial component that constitutes the organizational structures for managing the educational institution;
- the pedagogical systems that include the methods and means by which learners acquire education;
- the resource component that combines the financial, staffing, organizational, energy resources needed to support the life and development of the institution;
- the regulatory component that includes legislative and regulatory guidance for the management information system.

One of the tasks of the management information system of the educational organization is to ensure the process of the implementation of management functions in managerial decision-making. The presence of functional elements in the managed system causes the emergence of the relevant subsystems in information systems. In the organizational structure, the separation of managerial decision-making and control functions into separate structural elements causes the availability of appropriate subsystems within the information system, such as management decision and control. The first one provides the formation of plans, the development of orders and other forms of management decisions, and the second one provides their information support (Luhovyi, 2011).

The analysis of the practice of school management by means of ICT has allowed to evaluate the state of information support for educational quality management in the GSEI by such rates: the rate of information support for management of GSEI (R_{ism}), the rate of managerial information support (R_{mis}), the rate of scientific information support (R_{sis}).

In the course of our research, we analyzed the results of the survey of respondents and determined the rate of information support for the management of the GSEI (R_{ism}) according to the following formula:

$$R_{\text{ism}} = \frac{\sum_{i=1}^{n} R_{\text{is}}}{n},$$

where we define it as the simple average. The results of the initial processing of the received data are presented in Table 1.

We have submitted these calculations before (Tymoshko, Dubinina, Kravchynska, et al., 2020) but for the sake of completeness we consider submitting them now.

The data presented in Table 1 indicates that the highest-grade point average (GPA) is the legal and regulatory information, which is imperative for all hierarchical levels of quality management of education in GSEI. The average rate is R_{ism}≈0,74 and corresponds to the upper limit of a sufficient level. In particular, within the instructions of the Ministry of Education and Science of Ukraine (GPA≈1,70), the lowest rate has the information about international cooperation in the educational system and the ensuring quality of education (≈0,54).

According to the rates (Table 1), it is also possible to make a comparative analysis of the provision level of regulatory and normative information by the subjects of management and educational process of the GSEI of Kyiv region and cities of other regions of Ukraine (Sumy, Chernihiv, Zhytomyr, Kyiv). According to the results of the comparative analysis of the provision level data of educational institutions of Kyiv, Sumy, Chernihiv, Zhytomyr is somewhat lower than the Kyiv region, since the rate value refers to a satisfactory level, as well as the absence of significant differences between the values of the rate R_{ism}≈0,67 and 0,68 respectively, it means that is at the lower boundary of a sufficient level.

Table 1: The results of the assessment of the quality of education quality management by regulatory legal information (R_{ism})

	Score by respondents in the context of the region. Ukraine (360 respondents)

Content of external and regulatory information on the quality of education and its management structure according to the forms of its presentation	***Cities of other regions of Ukraine***	***Kiev region***	***Average value***
Legislative acts in education	1,51	1,35	1,43
Decisions of the Cabinet of Ministers of Ukraine	1,60	1,38	1,49
Provisions and instructions for the functioning and development of the GEI, ensuring equal access to quality education (MES of Ukraine)	1,78	1,63	1,70
Regulatory documents on the activities of the GSEI and education-al quality management	1,60	1,53	1,56
Instructional Letters of the Minis-try of Education and Science of Ukraine	1,27	1,66	1,46
Information on international cooperation in the education system and ensuring quality of education	0,38	0,7	0,54
R_{ism}	0,67	0,68	0,675

In this information subsystem (its indicators presented in Table 2), the highest score of the respondents rated the state of information providing on the content and organization of student's trainings (≈1,38), and the lowest score – information on strengthening and modernization of educational and material base of educational institutions (≈1,07). As a result of ranking, the value of the rate is in the range of values of a satisfactory level (R_{mis}≈0,56) and the lower limit of a sufficient level (R_{mis}≈0,56).

Table 2: The results of the assessment of the state of the educational process support in the GSEI and its content information (rate of management information support, R_{mis})

Content of internal management information	***Score by respondents in the context of the region. Ukraine (360 respondents)***		
	Cities of other regions of Ukraine	***Kiev region***	***Average value***
Information on the content and organization of training and cognitive work in the GSEI	1,52	1,30	1,41
Information on the content and organization of socially education-al work in the GSEI	1,49	1,39	1,44
Information on improving the professional and general competence of teachers	1,00	1,32	1,16
Information on the methodological support of the educational process in the GSEI	1,43	0,96	1,19
Information on strengthening and modernizing the GSEI educational base	1,22	1,03	1,12
R_{mis}	0,67	0,60	0,63

The results of the assessment of the state of the GSEI management scientific information support are presented in Table 3.

In the array of scientific information content (Table 3), the highest average score (R_{sis}≈1,025) respondents rated information about the modern achievements of pedagogical science, and the lowest (R_{sis}≈0,53) the information about modern achievements of the sciences related to management science, but which at the present stage of science development are of great importance for improving the quality of education and managing it effectively.

Table 3: The results of the assessment of the state of the GSEI management scientific information support (rate of scientific information support, R_{sis})

Content of external and internal scientific information in accordance with the fields of its production	***Score by respondents in the context of the region. Ukraine (360 respondents)***		
	Cities of other regions of Ukraine	***Kiev region***	***Average value***
Information about modern achievements of pedagogic	1,03	1,02	1,025
Information about the modern achievements of psychology	0,82	1,18	1,0
Information on the modern achievements of the educational management theory, general and informational management, general quality theory, systems of monitoring the quality of education in developed countries, the essence of international comparative studies of the quality of education	0,96	0,86	0,91
Information on the modern achievements of the sciences related to management – social informatics, qualimetry, information science, information civilization philosophy, attributive and functional concept of information	0,51	0,55	0,53
R_{sis}	0,42	0,45	0,435

Also, the production of external information is of great importance in our research. The analysis of the data (Table 4) of the respondents' questionnaire on the sources of external information receipt makes it possible to conclude that its greatest share is the periodic pedagogical press.

It ranks first in the ranking of other sources of information. Second and third places were shared by the district methodical office (scientific and methodological center) and the Ministry of Education and Science of Ukraine. The fourth place in terms of sources of information production for the GSEI is occupied by the education and science department of the city executive committee, which is logical because it is a structural unit of the city executive committee, whose activity is aimed at implementing state educational policy in the city's educational system.

Table 4: The results of the questionnaires ranking on the sources of external information to the GSEI

Sources of external information	***Number of respondents (360)***	***Rank***
MES of Ukraine	155	3
Department of Education and Science of Regional State Administration (RSA)	18	11
Regional State Administration (RSA)	18	11
District State Administration (DSA)	24	10
Regional executive committees	39	8
Department of Education and Science of the Executive Commit-tee of the City Council	150	4
Regional Institute of Postgraduate Teacher Education (RIPTE)	120	5
Department of Education of the district state administration	114	6
District methodical office, scientific and methodological center	240	2
Periodic Pedagogical Press	323	1
Pedagogical and methodological literature	102	7
Institutions that are functionally related to the GSEI	36	9
Media	15	12

According to the results of the survey of respondents using the questionnaire, the first three places (Table 5) were occupied by such sources of internal information on the quality of education and its management as subject teacher, class teacher and psychologist, which is quite justified because they are subjects of educational process and the main mission of their activities is to provide quality education for applicants. In the fourth place – the applicant as the subject and the object of educational activities and the self-organization of quality education, the fifth place was shared by the Deputy Director for Scientific and Methodological Work and the Director, in the sixth place – the Deputy Director for Educational Work.

Table 5: The results of ranking personal data on the sources of internal information in general secondary education

Sources of internal information on the quality of education and its management	***Number of respondents (total number – 360 people)***	***Rank***
Applicant	268	4
Subject teacher	340	1
Deputy Director for Education	157	6
Deputy Director for Behavior Disciplinary Education	115	12
Deputy Director for Scientific and Methodological Work	202	5
School Director (Superintendent)	202	5
Parents of students	90	14
Librarian	93	13
Psychologist	303	3
Class teacher	328	2
Social pedagogue	137	10
Chairman of the Scientific and Methodological Council	36	15
Principal of the department (or methodological association)	140	9
Deputy Director for Economic Affairs	188	7
Chairman of the student union (self-government)	134	11
Chairman of the Board of the educational institution	12	16

Respondents' ranking of sources of internal information on the quality of education and its management confirms the leading role of the administrative and managerial level in the process of direct influence on improving the quality of education, due to functional and job competence and implementation of the quality management cycle in general secondary education.

The data of the respondents' questionnaires on the

forms of accounting and storage of external information in general secondary education institutions is given in Table 6. The questionnaire reflects the monitoring of the study on the introduction of information technology in general secondary education institutions on the base of the previously developed questionnaire of the Ministry of Education and Science of Ukraine for principals of general secondary education institutions.

Table 6: Results of studying the forms of accounting and storage of information in general secondary education institutions (360 respondents)

Forms of accounting and storage of information	***Yes***	***Partial***	***No***	***Not sure***
Journal of information accounting	219	45	25	71
Information accounting file	226	60	70	4
GSEI database	46	136	129	49
Mixed form of information accounting	42	89	124	105
Map schemes, graph schemes	101	102	79	78
Excel spreadsheets on a computer	239	–	89	32

The analysis of the data in Table 6 shows that in the management of the quality of education in general education institutions, traditional forms of accounting and storing information on paper, a magazine and card files prevail. This is explained not only by the low level of computerization of general secondary education institutions (especially general secondary education institutions in rural areas), but also by the low level of computer literacy of school principals. It should be noted that the vast majority of respondents refer to the lack of scientific and methodological support for informatization of education quality management in general and guidelines for creating a computer database in particular, sufficient funding for the purchase of licensed electronic teaching aids, general software for secondary education, software and methodological kits that allow managers to independently manage management systems using information and communication technologies and evaluate the effectiveness of their work.

Methods and means of information processing that prevail in the management of principals of general secondary education are represented in Table 7.

Table 7: The results of the study of methods and means of processing external management information (360 respondents)

Methods of information processing	***Answers***	
	Number	***%***
Content study	237	65,83
Highlighting in the content of basic, essential information	189	52,50
Information analysis	183	50,83
Synthesis of information	81	22,50
Classification of information	28	7,77

Results of processing and analysis of personal data (Table 7) show that the vast majority of principals of general secondary education institutions prefer the following methods of information processing: studying the content of information, highlighting the main essential, analysis and synthesis of information, which is confirmed by affirmative answers 65,83 %, 52,50 %, 50,83 %, and 22,50 % of respondents, respectively. In the course of the questionnaire survey, it was found that respondents have difficulty in classifying information by its types, information flows, content, volume, sources of production and receipt, users and entities-producers of information and information resources (out of 360 respondents only 28 (7,77 %) acknowledged the existing skills to classify information and 72 (20,00 %) to summarize the data of analysis and synthesis of information).

Information processing and analysis tools have come a long way: from calculators and arithmometer, and from them to high-speed electronic computers (COMPUTERS), which open up new opportunities for the rapid processing of large amounts of information circulating in secondary education and information space, and which is necessary for the implementation of effective quality management of education.

Further, in the process of research, the degree of use of information in the development of various forms of management decisions in order to improve the quality of management in general secondary education (Table 8).

Table 8: The results of the study of forms of management decisions developed on the basis of external socio-pedagogical information (360 respondents)

Forms of management decisions	***Answers***	
	Number	***%***
Different types of plans	245	68,05
Decisions of the pedagogical council	261	72,50
Decisions of the general meeting of the labor collective of GSEI	12	3,33
Decisions of trade union meetings	24	6,66
Decisions of the scientific and methodical council of GSEI	12	3,33
Decision of the GSEI	36	10,00
Orders	261	72,50
Directives	57	15,83
Guidelines	45	12,50
Advices	15	4,16

According to the results of the study of forms of management decisions developed on the base of external socio-pedagogical information (Table 8), it was found that more than half of school principals (68,05 %) use information in developing various types of plans; 72,50 % – when writing orders; 72,50 % – in the development and decision-making of the pedagogical council; within 15,83 % – when writing directives. This indicates that heads

of general secondary education not only understand the importance of information in management, but also widely use it in the development and justification of various types of management decisions to improve the quality of the educational process.

Given the fact that the main component in the study of the quality of information support of secondary schools is the understanding of the principal of the institution the concept of "information support" and use in their professional activities, we conducted a survey among principals of secondary schools their understanding of the concept "information support of education quality management in general secondary education institutions". The analysis of the questionnaire yielded the following results: 61,0 % of respondents understand the concept of "information support of the SSEI" as office work; 49,45 % – noted that this concept is associated with the creation, interpretation, transmission, reception and archiving of documents or document management, but in a broader sense; 27,66 % of respondents interpret this concept as a set of optimal information about the quality education of students; 26,59 % – noted that this concept is associated with the collection, processing, analysis and transfer of information; 22,87 % – as the set of documents and statistical reports on the progress of students; 17,64 % of respondents indicated that these are legislative, regulatory, instructional and methodological documents entering the institution of general secondary education through electronic resources; 15,68 % of respondents understand this concept as analytical and statistical data on the institution of general secondary education; 14,81 % – as the set of external information about equal opportunities for quality educational services entering the institution of general secondary education; 13,50 % – as the organized set of a certain amount of information about the quality of education; 10,89 % – as processes of development and use of normative-legal information on activity of establishment of general secondary education for the purpose of acceptance and acceptance of administrative decisions; 8,30 % – as the set of knowledge and information required to manage the quality of the educational process; 3,92 % – as ensuring the process of quality management of education information; 3,48 % – streamlined statistics on the quality of education; 4,35 % of respondents could not answer the question at all.

Analysis of the above data gives us reason to conclude that the vast majority of responses represent differences in the interpretation of the essence of the concept of "information support for quality management of education in general secondary education". Classification and systematization of answers allow presenting them in a generalized form through a number of concepts such as information system, qualitative and quantitative characteristics of educational information, information processes, document flow, information culture, etc.

Thus, the process of information support of general secondary education institutions should take into account the following priorities: informatization of management processes of general secondary education institutions; informatization of the educational process, which significantly expands the possibilities of improving its quality; informatization of scientific, methodical activity, which gives the opportunity to pedagogical workers to independently increase their professional competence; access to various databases and electronic library funds of educational institutions, as well as knowledge clusters, grants, etc. It should be noted that the information support of the educational institution significantly influences the implementation of various learning models, especially in the context of the COVID-19 pandemic, the implementation of distance and blended learning. At the same time, our survey at the international level (15 educational institutions of Ukraine and Poland), in which 88 respondents took part, regulates that information support in a broad sense of the term affects the efficiency of the educational process. namely: 30,7 % of respondents said that distance learning took place online on various platforms; 26,1 % of respondents indicate that the training was carried out in the mode of lectures and seminars using ZOOM; 21,6 % – through social networks (Viber, Telegram); 54,5 % of respondents used their own laptops during online training; 23,9 % – desktop computers; 13,6 % – own smartphones. Taking into account the fact that educational institutions are not fully equipped with information technologies, as evidenced by the above study, teachers who took part in the online survey note that among proposals they see an improvement in the information and technical base of the educational institution. to ensure a high-quality educational process.

Therefore, for the principals of GSEI are of great importance not only to know the content of the external information necessary and sufficient for the implementation of the quality cycle of education in the educational institution and to make science-based management decisions on improving the quality of education, but also sources of its receipt and creation, accounting, preservation and presentation. information, processing techniques, possible and pedagogically appropriate forms of managerial decision-making, the ability to rationally identify users of information and the means of its transmission or storage.

Each of the above components of the information support process requires the study of its state in the quality management practice of the GSEI. Accordingly, we have developed a series of questionnaires for managers and administrative staff of general secondary education institutions, which relate to the study of the state of information support for quality management of education in GSEI. Conducting such in-depth research through the questionnaires made it possible to learn more about the state of the support of the educational quality management in

order to further create a full-fledged model of the informational support system of the educational quality management in general educational institutions in Ukraine.

However, regarding the development of information support for quality management of education in general secondary education institutions of Ukraine, new problems appear that need to be addressed. In particular, the completion of 2019/2020 took place in a remote form, the forced use of which is due to the COVID-19 pandemic. Effective distance learning in general secondary education institutions requires the solution of many technical problems with the involvement of modern computer technology. Among the main challenges that have arisen in the field of informatization of education are the following:

- the overcoming inequality of access of general secondary education institutions, teachers, students to information and communication technologies (such inequality is due to the lack of high-speed Internet in some areas; insufficient funding of secondary education institutions in terms of computer support of educational process and use of multimedia content in education; social-economic limitations of families in enabling their children to use computers for distance learning during quarantine, etc.);
- the need to create a single information platform for general secondary education, which will be mandatory for all students of general secondary education (the results of a survey of participants in the educational process show that the use of non-standardized, non-unified educational content complicates access to the information and the perception of educational material);
- ensuring safe and fast interaction between educational databases, as their diversity and variety of information and data formats complicate the use of educational content, does not allow obtaining reliable information about the state of development of information quality management in educational institutions of general secondary education in Ukraine;
- the creation at the national level of information databases with individual depersonalized data on school principals, students and teachers (such tools should be used as the base for identifying the educational trajectory of the student); assess the quality of educational services and the effectiveness of general secondary education by the level of success of its implementation in adult life; assess the quality of educational services and the effectiveness of general secondary education; individual data of principals and pedagogical workers will provide the account of real number of pedagogical personnel of establishments of general secondary education);
- the overcoming resistance to information innovations of the conservative part of participants of the educational process, due to the relatively low level of their mastery of IT technologies (solving problems of digitalization of educational processes in the context of overcoming the impact of the COVID-19 pandemic).

6. Conclusions and prospects for further research

Today much attention is focused on the identification of the factors that impede the creation of a complete informational support system of the educational quality management in general educational institution and aimed at exploring new approaches to overcome or minimize the number of difficulties encountered in the management process. And the methodological substantiation of the informational support system of the educational quality management in the GSEI of Ukraine and its usage in management practice will allow raising awareness of all subjects of management process on issues of management, information and communication support, optimal forms and methods of the team interaction. For GSEI leaders, the constant development of information competence is a condition for the simultaneous implementation of many actions related to various activities: managerial, pedagogical, psychological, methodological, organizational, research, economic, entrepreneurial, informational, innovative, public, etc.

The conducted questioning and interviewing of respondents and determination of the rate of educational quality management by different types of internal and external information provided the base for revealing more low and satisfactory levels of information support of the educational quality management, which is adequate realities of modern management practice.

Thus, results of the study clarified the status of existing problems in the information support of general secondary education, which in turn affects the quality of the educational process in institutions, namely: there is difficulty in making management decisions, solving specific management problems in critical conditions, the lack of an automated management system that accelerates management processes in general secondary education.

We also found that the heads of general secondary education institutions do not fully have information about grant projects of international organizations, results of international research on the quality of education PISA (international program for assessing the educational achievements of students), TIMSS (international comparative monitoring study of the quality of mathematics and science education), CIVICS (monitoring study of civic education), FIMS (monitoring study conducted by the International Federation of Sports Medicine), PIRLS (International project "Study of reading quality and text comprehension"), as well as InAU (Internet Association of Ukraine) which conducts monitoring research on the use of Internet resources, both in the educational process and in general. All of the above fully affects the quality of the

educational process and its development in accordance with European standards.

Results obtained provide the base for our further research, namely the identification of methods and means of processing external management information and the development and the scientific substantiation of a model of information support of the quality management education in the GSEI, which would provide quality support for management activities to improve the quality of education and further improve the usage of strategic, tactical and operational information by the heads of the GSEI.

References

[1] Buda, A. 2020. Stumbling Blocks and Barriers to the Use of ICT in Schools: A Case Study of a Hungarian Town. *Informatics in Education*, 19(2), 159–179. https://doi.org/10.15388/infedu.2020.08.

[2] Bykov, V. 2009. Models of organizational systems of open education.

[3] Bykov, V.Iu., Lytvynova, S.H. & Luhovyi, V.I. 2019. Development of theoretical bases of informatization of education and practical realization of information and communication technologies in education sphere of Ukraine.

[4] Dubinina, O., Hrytsiak, L. 2019. Formation Model of Future Progect Managers Information Culture. *American Journal of Engineering Research (AJER)*, 8(2), 72–77.

[5] Howard, S.K., Tondeur, J., Ma, J. & Yang, J. 2021. What to teach? Strategies for developing digital competency in preservice teacher training. *Computers & Education*, 165(5), 104149. https://doi.org/10.1016/j.compedu.2021.104149.

[6] Kalinina, L. 2008. The system of information security management of the comprehensive educational institution.

[7] Kalinina, L. 2008. The system of information support of management of the general educational institution.

[8] Kartashova, L. 2017. Children from the uncontrolled Donbas should understand that Ukraine is concerned about them. [Online]. Available : https://hromadske.radio/podcasts/kyiv-donbas/kartashova-dity-z-nepidkontrolnogo-donbasu-povynni-rozumity-shcho-ukrayina-turbuyetsya-pro-nyh. Accessed on: 17/02/22.

[9] Kartashova, L. 2020. Digital duplicate of an educational institution: a requirement of today. *Organizational and practical principles of development of digital educational space of educational institution: coll. materials All-Ukrainian scientific-practical internet conference*, 72–75.

[10] Kosenchuk, O.H., Bakhmat, N.V. 2019. Model of information and communication maintenance of preschool education quality management. *Information Technology and Learning Tools*, 69(1), 246–257. [Online]. Available : https://journal.iitta.gov.ua/index.php/itlt/article/view/2610/1449. Accessed on: 17/02/22.

[11] Kremin, V., Levovytsky, T., Ognevyuk, V. & Sysoeva, S. 2013. Educational reforms : mission, reality, reflection.

[12] Luhovyi, V. 2011. Information as a factor of human organization: theoretical and methodological aspect. Pedagogy and psychology. *Visn. NAPS of Ukraine*, 2, 14–21.

[13] Maslov, V. 2006. Information system and computer technologies in school management.

[14] National Doctrine of Ukrainian Education Development in the XXI Century. Decree of the President of Ukraine № 347/2002. [Online]. Available : https://zakon.rada.gov.ua/laws/show/347/2002#Text. Accessed on: 17/02/22.

[15] Poplavskyi, M., Bondar, I. 2021. Application of Information Technologies for Lifelong Learning. *IJCSNS International Journal of Computer Science and Network Security*, 21(6), 304–311. https://doi.org/10.22937/IJCSNS.2021.21.6.39.

[16] Reuge, N., Jenkins, R., Brossard, M., Soobrayan, B., Mizunoya, S., Ackers, J., Jones, L. & Grace Taulo, W. 2021. Education response to COVID 19 pandemic, a special issue proposed by UNICEF: Editorial review. *International Journal of Educational Development*, 87(11), 102485. https://doi.org/10.1016/j.ijedudev.2021.102485.

[17] Richmond, G., Bartell, T., Cho, C., Gallagher, A., He, Y., Petchauer, E. & Cardenas Curiel, L. 2020. Home/School: Research Imperatives, Learning Settings, and the COVID-19 Pandemic. *Journal of Teacher Education*, 71(5), 503–504, https://doi.org/10.1177/0022487120961574.

[18] Saikkonen, L., Kaarakainen, M.-T. 2021. Multivariate analysis of teachers` digital information skills – the importance of available resources. *Computers and education*, 168(7), 104206. https://doi.org/10.1016/j.compedu.2021.104206.

[19] Savchenko, O. 2001. Key competencies – innovative result of school education. *Ridna shkola*, 8–9, 4–8.

[20] Savchenko, O. 2010. Management of the quality of school education in the context of state educational policy. *Proceedings of a scientific and practical conference held*, 1, 15–18.

[21] Tymoshko, G. 2019. Pedagogical skill as a vector of organizational culture development of the head of educational institution. *Bulletin of the Taras Shevchenko National University «Chernihiv Collegium»*, 157, 222–228.

[22] Tymoshko, A., Dubinina, O., Kravchynska, T., Burlaienko, T. & Sholokh, E. 2020. Information support for quality management of education in general educational institutions of Ukraine. *Educational Dimension*, 55, 285–302. https://doi.org/10.31812/educdim.v55i0.3949.

[23] Zabrodska, L. 2002. Informatization of the management of educational process in a comprehensive educational institution.

[24] Zhao, Y., Pinto Llorente, A.M. & Cruz Sanchez Gomez, M. 2021. Digital Competence in Higher Education Research: A Systematic Literature Review. *Computers and education*, 168(7), 104212.

https://doi.org/10.1016/j.compedu.2021.104212.
[25] Zhebrovskyi, B. 2001. Formation of professional readiness of the headmaster to manage the quality of education.

Tetiana Kravchynska PhD of Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Philosophy and Adult Education of the Central Institute of Postgraduate Education "University of Education Management" of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine.
ORCID ID 0000-0002-7521-3508

Oksana Dubinina PhD of Pedagogical Sciences, Associate Professor, Associate Professor of the Dept. of Public Administration and Project Management, Educational and Scientific Institute of Management and Psychology of the State Higher Educational Institution "University of Education Management" of the National Academy of Educational Sci-ences of Ukraine, Kyiv, Ukraine.
ORCID ID 0000-0002-5405-8502

Krystyna Chałas Dr. hab., Professor, the Head of the Department of Didactics of School Education and Pedeutology of The John Paul II Catholic University of Poland, Lublin.
ORCID: 0000-0002-8303-5211

Tetiana Burlaenko PhD of Pedagogical Sciences, Associate Professor, Head of the Department of Economics, Entrepreneurship and Management Educational and Scientific Institute of Management and Psychology of the State Higher Educational Institution "University of Education Management" of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine.
ORCID ID 0000-0001-5734-4611

Anna Tymoshko Doctor of Pedagogical Sciences, Professor, Professor of Pedagogy, Administration and Special Education Educational and Scientific Institute of Management and Psychology of the State Higher Educational Institution "University of Education Management" of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine.
ORCID ID 0000-0003-0996-6138

Olena Sholokh Senior lecturer at the Department of Pedagogy and Methods of Teaching History and Social Disciplines Taras Shevchenko National University "Chernihiv Collegium" Chernihiv, Ukraine.
ORCID ID 0000-0001-5258-8086

Alla Vinichenko PhD in history, Associate Professor of Dept. of Public Administration and Project Management, Educational and Scientific Institute of Management and Psychology of the State Higher Educational Institution "University of Education Management" of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine.
ORCID ID 0000-0003-2641-9769