



THE MANAGEMENT STRUCTURE OF DIGITAL EDUCATIONAL DATA SYSTEMS AND ORGANIZATIONAL APPROACHES TO MODELING AND ANALYSIS OF EDUCATIONAL DATA IN THE COUNTRIES OF THE WORLD

A ESTRUTURA DE GESTÃO DE SISTEMAS DE DADOS EDUCACIONAIS DIGITAIS E ABORDAGENS ORGANIZACIONAIS PARA A MODELAGEM E ANÁLISE DE DADOS EDUCACIONAIS NOS PAÍSES DO MUNDO

LA ESTRUCTURA DE GESTIÓN DE LOS SISTEMAS DIGITALES DE DATOS EDUCATIVOS Y LOS ENFOQUES ORGANIZATIVOS PARA LA MODELACIÓN Y EL ANÁLISIS DE DATOS EDUCATIVOS EN LOS PAÍSES DEL MUNDO

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Abstract: The article presents data from the international analysis of national educational databases. The characterization of educational databases was carried out according to a number of several criteria. Based on the results of the study, conclusions are drawn about the general properties and differences between Digital systems of educational data and educational statistics in different countries and the dependence of differences on a number of factors. The grounds for making managerial decisions based on the analytics of educational data and the distribution system of functions in the management structure of digital educational databases are described.

Keywords: data-based education management, digital system of analytical and statistical databases of educational data, monitoring education; parameters of the quality of education.

Resumo: O artigo apresenta dados da análise internacional de bases de dados educacionais nacionais. A caracterização das bases de dados educacionais foi realizada de acordo com vários critérios. Com base nos resultados do estudo, são tiradas conclusões sobre as propriedades gerais e diferenças entre os sistemas digitais de dados educacionais e estatísticas educacionais em diferentes países e a dependência das diferenças em uma série de fatores. São descritos os fundamentos para a tomada de decisões gerenciais com base na análise de dados educacionais e no sistema de distribuição de funções na estrutura de gestão de bancos de dados educacionais digitais.

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Palavras-chave: gestão educacional baseada em dados, sistema digital de bancos de dados analíticos e estatísticos de dados educacionais, monitoramento educacional; parâmetros da qualidade da educação.

Resumen: El artículo presenta datos del análisis internacional de bases de datos educativas nacionales. La caracterización de las bases de datos educativas se llevó a cabo de acuerdo con varios criterios. A partir de los resultados del estudio, se extraen conclusiones sobre las propiedades generales y las diferencias entre los sistemas digitales de datos educativos y las estadísticas educativas en diferentes países y la dependencia de las diferencias en una serie de factores. Se describen las bases para la toma de decisiones gerenciales basadas en el análisis de datos educativos y el sistema de distribución de funciones en la estructura gerencial de las bases de datos educativas digitales.

Palabras clave: gestión educativa basada en datos, sistema digital de bases de datos analíticas y estadísticas de datos educativos, seguimiento de la educación; parámetros de la calidad de la educación.

1 INTRODUCTION

In the context of the creation of the National Data Management System in Russia, the need for developing an organizational system for managing digital databases, including educational data, systematized and produced by educational organizations, data on the educational results of students and data on the development of the educational sphere, is becoming urgent. In search of practical approaches to implementing the Concept of creating a Unified Digital Platform for Science and Education in Russia, an analysis of the approaches to managing national databases implemented in countries of the world is also necessary. For Russia at the state level, the formulation of the problem of national databases, including educational data, is a relatively new task. The need to solve the problem is recorded in state documents: 1) Order of the Government of the Russian Federation of June 03, 2019. N1189-r "On approval of the Concept for the creation and functioning of a national data management system" (and the corresponding Roadmap for the implementation of the Concept); 2) Letter of the Ministry of Education of the Russian Federation of September 20, 2019 N MP-1165/02 "On the implementation of the federal project" Digital educational environment "and related regional projects."

In this regard, a comparative analysis of the existing approaches in the countries of the world to ensure the creation, operation and development of national educational databases and related management systems is needed.

2 LITERATURE REVIEW

The study was conducted on the basis of a synthesis of information on national databases of educational statistics and educational analytics, collected in open sources of the Internet and publications in scientific and pedagogical publications, in accordance with certain criteria that are significant for the analysis of the construction and functioning of educational databases in different countries, in within the framework of the implementation of the project RFBR "Russian Foundation for Basic Research" N19-29-14016 "Methodology for the analysis of big data in education and its integration into training programs for teachers and heads of educational institutions in the logic" Pedagogy based on data", " Management education on the basis of data" (project supervisor - O. A. Fiofanova).

The search for information was methodically carried out both in terms of using the content of well-known domestic scientific works in the field of this study (Fiofanova, 2020a; 2020b; 2020c; 2020d; Fiofanova et al., 2020), and in terms of collecting data on the following key formulations: in Russian - "Database in



Education”, “Educational Base data”, “Database of educational statistics”, “National educational database”, “Services of statistics and analytics of data in education”; in English - “Database of educational statistics”, “The national education database”, “Services for statistics and data Analytics in education”; in German - “Datenbank der bildungsstatistik”, “Die nationale bildungsdatenbank”, “Dienstleistungen für Statistik und Datenanalyse in der Bildung”; in French - “Base de données des statistiques de l'éducation”, “La base de données nationale sur l'éducation”, “Services de statistiques et D'analyse de données dans l'éducation”.

3 MATERIALS AND METHODS

In total, using these methods, information was collected and further analyzed on educational databases or educational databases (hereinafter - EDB) created and operating in the following 10 countries - in addition to the Russian Federation, also: in the UK, France, Germany, Austria, Switzerland, Luxembourg, USA, Japan, Kazakhstan. In addition, in the HBS aspect, also at the level uniting one or another country (taking into account the delegation by these countries of a number of their national powers in the field of educational data circulation to the level of country unification), the interaction of some of these EDB with the EDB within the database is partially addressed The European Union - Eurostat (in relation to the full analysis of the construction and functioning of the HBS within the Eurostat database, this study also received the necessary material, but the volume of the article at this stage does not allow the author to present it here, and therefore a detailed review of these data, in conjunction with the generalized characteristics of the HBS of countries belonging to the European Union, to take into account the relevant experience in improving the EDB in the Russian Federation, will be the subject of another article by the author).

The selection of these countries is determined by the following aspects of this study: a) taking into account solutions to the problems of building and functioning of EDB in countries representing regions of the world, according to numerous international studies related to the most developed in the field of education (Europe, Asia, North America); b) providing the possibility of comparing solutions to these issues in our country (Russian Federation), firstly, with the CIS countries (for example, Kazakhstan), secondly, with the EU countries, and thirdly, with developed countries of the far abroad (for example the USA and Japan); c) consideration of the features of the construction and use of EDB in countries that historically have the greatest experience in this, belonging to well-known leaders in the field of educational innovations and at the same time representing a wide range of features unique to each individual country (Great Britain, USA, Germany, France, Japan); d) consideration of the degree of differences in solving the problems of building and using EDB between countries that are as closely interacting with each other as national-state entities, for cultural and historical reasons related to the same language native to most of the peoples living in them (Germany, Austria, Switzerland); e) taking into account the experience of building and using EDB, which is generally used for countries not only because of their scale and leadership in relevant issues, but is generally relevant and therefore implemented in any countries, including “small” ones (using the example of Luxembourg).

The collection and synthesis of information in the course of this study was carried out in accordance with the following criteria that are significant for the analysis of the construction, functioning of educational statistics databases in various countries and reflecting the technological processes of assembly, initial analysis, structuring and information exchange in the EDB system of a specific country:

- criterion 1. Bodies, organizations, institutions, leading different parts of EDB (how this EDB is distributed among such bodies, organizations and institutions) responsible for collecting, analyzing and ensuring the use of educational data in a particular country;



- criterion 2. Legal and / or working documents governing the functioning of the EDB in a particular country, including the collection, analysis and use of educational data;
- criterion 3. Sources of receipt (origin) of these data in the EDB system of a specific country;
- criterion 4. Composition, structuring and relationships of these data in the EDB system of a specific country;
- criterion 5. The main indicators of the quality of education, taken into account in the EDB system of a particular country;
- criterion 6. Use of the data of individual educational achievements (including in the digital portfolio) of students in the EDB system of a specific country;
- criterion 7. Directions (or examples of directions) of the analysis of data stored in the EDB of a specific country;
- criterion 8. Directions (or examples) of use and main users of data stored in the EDB of a specific country;
- criterion 9. Relations with national and supranational projects and programs carried out in the EDB system of a specific country.

4 RESULTS

In accordance with these criteria, the main results of collecting and summarizing information about HBS in each of the above countries are presented below (the numbers of sections of information about EDB in each country correspond to the numbers of these criteria).

United Kingdom.

1. The system of organization and functioning of EDB in the UK includes the following structures, which are distributed EDB in this country, with an appropriate separation of the functions of production and regulation of the collected, analyzed and used data:

- The Department of Education of the United Kingdom (sometimes referred to as the UK Department of Education) publishes official statistics on education and children (UK Department of Education website, n.d.). The Ministry, in the person of its respective representatives, in terms of educational data turnover, is part of an interagency association of all bodies and organizations that participate in the production of official (state) statistics in the UK - The Government Statistical Service - GSS (The State Statistical Service of the Government of Great Britain, n.d.), which includes, in particular, the Office of National Statistics (see below) and ministries (represented by their representatives - bodies that regularly collect, analyze and use data on the profile of their activities). The GSS also includes autonomous administrations in Northern Ireland, Scotland, Wales and is controlled by the UK Statistics Authority (UK SA) and, like other participants in the country's EDB system, maintains its part of the EDB, reflected for a wide range users on your site;

- Office of National Statistics (Office for National Statistics - ONS (UK Office of National Statistics website, n.d.), which is the executive body in the UK Government in statistics and the largest producer of official statistics in the UK. This Office performs the functions of a state organization producing official statistics in the UK, and at the same time functions as a research center (research institute), which analyzes data and generates proposals both for their use and for improving the content and organization of the collection, recording, generalization and use of relevant databases (including in the part of EDB). Moreover,



ONS is positioned as an independent body operating “at arm's length from the government”, and the requirements of this independent body are, in accordance with the Law on the Statistics and Registration Service, mandatory for all participants in the collection and circulation of statistical data in the country, including, in the part of the EDB - in the case of a statement about the collected data as official, and not just formed for the purpose of conducting scientific research expressing the opinion of their authors. The ONS statutory goals are to promote and protect the production and publication of official statistics, which “serves the public good”, which includes: assisting in the development and evaluation of public policies based on the use of data, regulating quality and publicly combating the abuse of statistics. The Ministry of Education interacts with ONS by sending him data, the collection and analysis of which was carried out by the Ministry, and receiving educational data collected by ONS on a national scale from him;

- ONS operates its unit - the Office for Statistics Regulation (OSR (The Office for the Regulation of Statistics in the UK, n.d.)), which is the regulatory unit of the Office of National Statistics in relation to the activities of bodies and organizations conducting the collection, statistics, analysis and storage of data in the UK, including educational data: it verifies compliance with the detailed requirements (principles and norms of practice of relevant activities) established by the state regulatory document - the “Code of Practice for Statistics” - when generating and implementing the circulation of official state statistics, for which the specified unit performs the following actions: assessment one or another product included in official statistics for compliance with this Code; preparation of reports on special cases and system-wide issues in terms of how certain statistics are used, noting when the requirements of the Code are being met, and publicly contesting those data or using the data when they are not being met (requiring that such data or activities be use in accordance with the Code), including in terms of ensuring the reliability, quality and social value of certain data;

- Coordination of the work of these bodies and organizations is carried out on the basis of quarterly meetings of the Interdepartmental Committee (IAC, n.d.), which includes the National Statistician (Chairperson), whose activities are supported by his apparatus - the National Statistical Executive Group (NSEG), and the Main Statistics by Sector. These meetings are held to ensure coherence between the administrations of all relevant bodies, organizations and address inter-departmental issues in the field, including maintaining the EDB.

2. The requirements for the functioning of the state statistics system, including the EDB system, in the United Kingdom are established by the Law on Statistics and Registration Service (2007). a detailed set of principles and practice standards for the relevant activities are established by the state regulatory document - “Code of Practice for Statistics” (The Code of Practice for European Statistics in the UK State Statistical System, n.d). Another regulatory document - “Memorandum of Understanding” - describes the duty of the Cabinet of Ministers in relation to ONS as a competent independent body, including in the field of maintaining state EDB.

3. The bulk of the official statistics in terms of volume and weight is created by specialists working under the auspices of one or another body or organization that is part of the GSS. However, other bodies or organizations may also be producers of official statistics if they are indicated in any of the by-laws, collectively called “Legitimizing Documents”, which were put into effect from 2007 to 2018, and if the data they collect classified by ONS, in accordance with the requirements of the Code, to official class statistics. In the framework of the British EDB, data are used that are collected “institutionally” - for schools, institutions of additional and higher education, and also “non-institutional” - data on children and youth outside educational institutions, to compile official statistics in accordance with the standards established by the above Code. All of the above mentioned in the information on criterion 1. The bodies and organizations carry out the exchange of data regarding the EDB.



4. The data structure in the UK EDB varies depending on the organization that maintains this particular part of the HBS. So, the structure of educational data presented on the GSS website includes sections (consisting of a number of subsections) that reflect the aspect of professional development of students, with an emphasis on activities related to Big Date. The main part of the UK EDB, located in the Department of Education of the Kingdom and reflected on its website (“Statistical collections”), has a structure that includes the following sections and subsections (in turn, also having subsections, with the allocation of various groups of information): a) Early years (subsections - Participation and characteristics, Institutions, Achievements); b) Social assistance to children (Participation and characteristics, Institutions, Human resources); c) School statistics (for all ages) (Participation and characteristics, Institutions, Human resources, Finance, Achievements, International practice); d) Elementary school (Participation and characteristics, Institutions, Achievements); e) High school (Participation and characteristics, Institutions, Achievements); f) From 16 to 18 years (Participation and characteristics, Achievements); g) Additional adult education; h) Higher education (Finance, Results, Participation and characteristics, Human resources); i) Manpower (Schools; The early years; Social assistance to children; Higher education); k) Funds and finances (Higher education; Schools).

5. The composition of education quality characteristics monitored in the UK HBS is regularly updated on the basis that the Statistical Office conducts analysis of the largest trends in education and vocational training at least 2 times a year based on the statistics obtained (the content of the data collection areas is determined Statistical Board in the UK - see below for criteria 7., 8.). Analytical conclusions about one or another currently relevant aspect of the quality of education are published in the framework of the section “Children, Education and Skills” on the website of the Office (The Code of Practice for European Statistics in the UK State Statistical System, n.d.), as well as in specialized journals, mainly in the journal Systemic / Monitoring Reviews.

6. The specifics of working with individual data in the UK EDB is that the main attention in this part is not providing any citizen of the country with the opportunity to find work in any region of the United Kingdom or, especially, in other countries (including the EU), and that, through the Careers section of the website of the Office of National Statistics, provide new opportunities for residents to pursue career growth by providing them with the Office of their educational data and their requests, followed by counseling and training through the appropriate service within the Office (UK Office of National Statistics website, n.d.), a significant emphasis is placed on activities related to working with data, including Big Date.

7. Data analysis, including EDB, and the use of the results of this analysis in the interests of improving relevant practice areas are carried out in the country in accordance with the following principle established by the above Code: “assistance in the development and evaluation of public policies in order to mobilize the power of data, ... to help Britain make better decisions. ”

The website of the State Statistics Service (GSS), which is run by the GSS Good Practice Group, based in the National Statistics Office (ONS), informs everyone, including about the latest news on updating the databases in the country and understanding these updates - this can be considered the main form of ensuring the use of data, including EDB data, in a broad social aspect.

To ensure effective analytical decision-making on the use of data, including EDB data, subcommittees (councils and groups in relevant areas) are created within the UK Statistical Council to formulate decisions of strategic importance, and these subcommittees are responsible for such decisions before leadership of the Council. In order to regularly analyze and present the results, the Council should also make a report to the Chairs and Committees of the Director General for Regulation. The preparation of such reports, their consideration, decision-making on them and ensuring the use of decisions on a national scale are regulated by the Council, published on the ONS website.



To ensure competent analysis and use of data in society, including by employees of educational institutions, special training programs are implemented in the UK, mainly implemented nationwide outside the public service (see below for information on criterion 9).

8. Planning for the implementation of state projects in the field, including the formation and functioning of the EDB, is carried out by a subcommittee of the Statistics Council, called the Regulatory Committee, which is authorized to initiate the implementation of projects in order to prepare assessment reports in certain areas of the state, including educational , policies, and determine whether specific data sets can be attributed to national statistics (subject to the consent of the President of the Council acting on his behalf). The Committee makes recommendations to the Board of the Council regarding the general program of work and the composition of statistical data, which should be evaluated as part of the project.

It is also advisable to note that in the UK EDB system, programs of training providers for competent collection and use of data are implemented on a national scale outside the public service (applications for participation in these programs are submitted through a group of GSS specialists):

- Royal Statistical Society (RSS). RSS offers statistical training for the general public. A list of their courses is available on the RSS site;

- European Statistical Curriculum (ESTP). The purpose of the ESTP program is to provide statisticians with the opportunity to participate in international training courses, seminars and workshops for graduate students. Information on this program is available on the Eurostat website.

France.

1. In France, the HBS system, similar to the UK, is multicomponent, and, unlike the United Kingdom, the bodies and organizations that ensure the functioning of the EDB at the national level only interact with each other, not being in a state of subordination or even control over each other :

- The Directorate of Assessment, Forecasting and Efficiency (DEPP – (The Directorate of Evaluation, Forecasting and Performance, n.d.) carries out forecasting to improve the management of the effectiveness of activities in the field of education and vocational training. The data collected and compiled by the Directorate contribute to the evaluation of policies pursued by the French Ministry of National Education. The Directorate of Assessment, Forecasting and Efficiency (DEPP) is both an independent department of the education system and the statistical service of the French Ministry of National Education, which is responsible for education statistics and thus is the main link in the formation and functioning of the HBS in the country, coupled with the statistical services it administers in academies (SSA), which, taken together, ensures the reliability and uniformity of statistical information on education in the country. Accordingly, DEPP is part of the State Statistical Service (SSP), consisting of the Central Service (INSEE) and statistical services of line ministries; DEPP activities are controlled by the Office of Official Statistics of France;

- The Inspectorate General for Education, Sports and Research (IGÉSR – (Inspectorate of Education, Sports and Research, n.d.) is the body under the direct and joint leadership of the ministers responsible for education, higher education, research and innovation, youth and sports. It provides assessment, examination, control and development of recommendations for improving decisions made on the basis of data collection and analysis;

- The National Supervisory Council for the Safety and Accessibility of Educational Institutions (The National Security Supervisory Board and the availability of educational institutions in France, n.d.) - an organization that studies the condition of buildings and equipment, evaluates the conditions of safety, hygiene, accessibility and safety for serious risks to an educational institution;



- The Higher Program Council (CSP – (The Supreme High Council of France, n.d.), bringing together scientists, researchers, specialists in the education system and elected representatives of the nation and society, is an independent public and professional body under the French Minister of National Education, which formulates proposals for improving education management based on information contained in the national EDB.

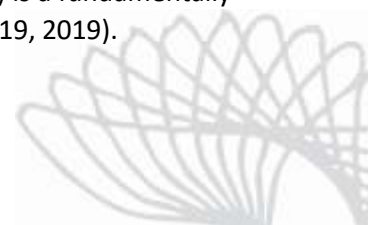
2. The basic principles in force in the education system, including the system for the formation and circulation of educational data, are established in France by a legislative act - the Education Code. Also, DEPP, as the central organization for maintaining EDB in France, in its activities is guided by the Code of Practice for European Statistics, which is valid under the auspices of Eurostat (the EU Statistical Office), implementing its basic principles (independence, honesty and responsibility) and the standards established by it from the process of developing methods collection of statistics and their production before dissemination as official European statistics. The French State Statistical System, including the EDB system, is also part of the European statistical system regulated by Regulation N 223/2009 of the European Parliament and of the European Council of March 11, 2009 on European statistics, as amended by Regulation No. 2015/759 of April 29, 2015 d. These regulations are based on a set of key values of conducting public statistics: reliability, quality, independence, common interests, public services, usefulness, respect for respondents. France, like all EU countries, has adopted the "Code of Good Practice", which sets out general obligations in the form of sixteen principles aimed at respecting these fundamental values when collecting and using data, listening to its users and making full use of it official statistics in the public interest.

3. The formation and replenishment of EDB in France is carried out on the basis of the exchange of data between the above participants in the EDB system in the country, collected by them independently. At the same time, DEPP plays the role of a coordinator of research aimed at collecting and compiling data in the field of education, in particular with regard to the quality of educational policy: it monitors and assists in the framework of agreements with research groups (logistically, financially and scientifically, including by facilitating ensuring the correct collection of reliable data) in determining the direction and carrying out the relevant work by various external partners. He also collaborates with specialists and recognized researchers to develop new tools and research in order to better evaluate public policy or obtain relevant indicators.

4. Priority areas that define the characteristics for data collection in the EDB system, in the part formed by the General Inspectorate of Education, Sports and Research: a) the study of priority topics selected by the relevant ministers to assess the effectiveness of public policy in the fields of general and vocational education, youth policy and public sports; b) control over services, institutions or bodies under the jurisdiction of specialized ministries or under their supervision; c) assessment of problems of a promising (forecast) nature in the areas selected by the General Inspectorate itself.

In the part of the EDB formed by the Directorate of Assessment, Forecasting and Efficiency (the "Research and Statistics" section, which includes statistics from the Ministry of National Education that describes students, staff, educational institutions, education in the territories, presented and analyzed in regular publications, information notes, reference books, as well as using detailed data using time series), the emphasis today is on tracking data characterizing the success and problems of the renewal of school education initiated by the Higher Program Council, aimed at ensuring greater continuity of all levels of additional professional training and education, as well as greater realization of educational potential all students.

5. Making decisions on the challenges of developing the education system in France. Currently, higher education institutions regularly monitor the characteristics of the quality of education carried out in secondary, technological and vocational schools. between school, college, high school and in the afternoon. The implementation of DEPP in the framework of the project "Higher Software" (ELAINE) is a fundamentally new area of research in the field of education (Digital education at a school in Europe 2019, 2019).



6. The emphasis in accounting for individual data in the EDB system in France is currently made to ensure that this accounting provides the most complete and consistent training for students starting from kindergarten and ending with the last year of vocational training, the aim of which is to “give all students the opportunity to become free and enlightened”.

7. Suggestions for improving education management are formulated by the Higher Program Council on a scientific and analytical basis, with the study of available educational data. IGÉSR annually submits to the ministers responsible for education, higher education, research, youth and sports, analytical reports prepared at the request of the relevant ministers or in accordance with the program of activities of the IGÉSR to conduct various assessments in the field of education and youth policy. DEPP also provides partners with the data it has in a convenient structure for analysis.

8. When solving its tasks, the Supreme Program Council creates expert groups and widely informs the public, including about important generalized educational data and the results of their analysis. IGÉSR, in addition to the powers granted to it by law and regulations, carries out local counseling programs on education, youth policy and public sports, conducting public readings, preparing and disseminating documentation in the community, and replenishing library collections using the data collected by IGÉSR and its partners data in the field of training and education of children and youth. DEPP promotes the promotion of research results within the EDB system of France by posting relevant data on its website (section “Research and Statistics”) and data on categories, months and years of publications on the website of the Ministry of National Education (in the section “Publications, Reports and Statistics”).

9. The programs mentioned above in criterion 8. are implemented by IGÉSR at the request of the ministers responsible for education, culture, research and innovation, youth and sports, or in accordance with the IGÉSR program of activities. IGÉSR is also periodically authorized by one of the ministers under whose authority he is to carry out missions related to the discussion and use of development-relevant data with the participation of other state bodies, local authorities, foundations and associations, including those representing foreign states, The European Union or other international organizations. The Supreme Program Council, as a social and professional body under the French Minister of Education, regularly exercises its authority to initiate national state projects aimed at obtaining the data necessary, in the competent opinion of this council, for improving educational policy in the country. Under the DEPP, the Mission for European and International Relations (MIREI) operates the French unit of Eurydice (The French unit Eurydice, n.d.) - the European network for education systems, piloted by the European Commission's Executive Agency for Education, Audiovisual Media and Culture. This network brings together 38 countries that participate in the EU's lifelong learning program, according to which the education systems of countries from preschool to higher education are described on the Eurydice website. The network publishes annual reports (school calendars, school hours, salaries of teachers and school leaders, etc.), including special reports on topics that are considered priority in European education systems. Eurydice's national units regularly update feature articles on the site, filling it with up-to-date educational data.

Germany.

1. In Germany, as in other German-speaking countries, the structure of the movement of educational data in a network of interconnected federal and regional databases of these data is determined by the structure of management and organization of different levels of education (in accordance with this, for example, for secondary education, the movement of data is carried out from schools to the land authorities and further to the relevant federal ministry, and for higher education - from universities directly to this ministry). The supreme bodies that oversee the education system in Germany are the Federal Ministry of Culture and the Federal Ministry of Education and Science, which actively interacts in the analysis of educational data with the Federal Land Commission for the Planning of Education and the Promotion of Research (The Federal Ministry of Education and Science of Germany, n.d.). The second of these ministries,



in a significant part of their functions, is subordinate to the country's higher educational institutions. In addition, the Federal Republic of Germany has a Permanent Conference of the Ministers of Culture of Lands (KMK) to coordinate the activities of the land education administration bodies, primarily of the pre-university level, including schools. In each Land Region of Germany, all secondary educational institutions fall under the jurisdiction of the corresponding Land authority - the Ministry of Culture of the region. Moreover, in each region (Land) there is a sufficiently developed structure and form of various educational institutions in form and content. At the first stage, the student enters Primary school, then he has a large selection: Primary, Secondary, Real school or Gymnasium. After graduating from some of them, students immediately get the opportunity to work in their specialty, after others they must still complete their studies or practice, and only after receiving secondary education in a classical gymnasium can a graduate immediately apply for the right to enter the university. But after any stage of education, the student can continue to study, combining study with work, and, if desired, and good results, can go to college. Taken together, this determines, in aggregate, the educational trajectory of each individual student. In accordance with this, the federal database of educational data (Datenschutzerklärung, for example, as part of the Federal Ministry of Education and Science maintained by a special unit of the ministry - Bildungsamt) accumulates, stores and operates with information on such a trajectory, both for each individual student (graduate) and in relation to generalized data - arrays of various sizes, depending on the extent of generalization in a particular case (The Ministry of Culture of the State of Hesse, n.d.).

2. All activities in the education system, including the structure of education, which determines the structure of data movement in regional and federal educational databases, are governed by the relevant provisions of the Federal Basic Law and the Constitutions of the Lands, and in the part of higher education by the General Law "On Higher Education" (Kananykina, 2013).

3. Databases that store information on the results of these exams, as well as other information in the field of education, are maintained: 1) in the Lands - at the regional Ministry of Culture, which receives data from institutions of additional professional education; 2) generalized data (for institutions of all levels of education) - centrally under the above-mentioned federal ministries: in the field of general education (data come to the federal level from the Land Ministry of Culture) and in the field of different levels of professional education (for the level of primary professional education, data also come from Land ministries of culture, and for the next levels of professional education - directly from educational organizations to the federal level). One of the main sources of educational data in the German EDB system is exams after the end of each stage of education, with federal education standards playing a significant role in determining their content at this stage (the currently evolving sample set of educational quality requirements) that meets European standards (requirements for the quality of education of students promoted by the European Union).

4. The structure of the monitored data in the system of the ministries of culture of the Lands as the main includes the following sections (Pisareva, 2012): preschool education (not considered as a level of education); education in public schools; education in special schools (for children with developmental disabilities); education in real schools (oriented in the future primarily to the acquisition of the profession of a worker or employee); education in high schools; education in other types of general educational institutions and in the framework of extracurricular areas of education; problems of personal development and socialization of youth; education in vocational schools (institutions of primary vocational education); extracurricular work (with special attention to the organization of sports activity of students); adult education.

5. When analyzing the quality of vocational education according to the exams, special attention is paid in Germany to the following characteristics, considered, for example, in the annual reports of the Federal Council for Vocational Education - Bundes-Berufsausbildungsbeirat (Statistisches Jahrbuch 2006 für das BRD, 2006): the suitability of the student; its practical versatility; the student's consent with the existing test



procedure (indicating that students understand the value of quality education for their lives); didactic qualification of the student.

6. Educationally significant data about students, both personal (psychological) and the results of exams of different levels are collected in educational institutions and transmitted to higher authorities.

7. The data received at the regional and federal levels following the results of student exams are analyzed in accordance with the requirements mentioned above, as a result of which generalized information and conclusions about the quality of education are periodically reflected in various statistical reports of an analytical nature (as a specific sample in this regard, we can consider Statistical and analytical report of 2013 on the development of the quality of education in Germany and Austria based on the use of research to develop students' learning skills prepared by well-known German experts in the field of quality of education G. Dornmeier and S. Novak (2013)). Also, the EDB data in the Federal Republic of Germany are regularly reviewed to develop specific requirements for the quality of education, considered in the framework of exams - by examining the statistics accumulated in sections of regional and federal databases on the results of previous exams, it is maintained by the Federal Ministry of Education and Science and a number of German research centers: at the University. A. Humboldt, at the Institute of Applied Psychology, etc. At the regional level, the Secretariat of the Ruling Mayor participates in such an analysis.

8. Data on the results of students checking exams are considered to characterize the quality of the implementation of a particular level of education and, in particular, for the levels of professional education, the degree of students' possession of one or another specialty - for the country as a whole and for each Earth. The organizing role in this activity is played by the above-mentioned regional and federal governing bodies. Also, regarding the use of data stored in the EDB system, it should be noted that in Germany particular importance is given to the possibility of issuing information about the results of examinations to employers from any country of the European Union at their request to the federal ministry (by prior consent of the student, graduate), since for a graduate of a vocational education organization, it may be possible to get a favorable offer on the labor market, not necessarily in Germany, but also in other EU countries.

9. Interstate interaction of the federal authorities of Germany that store educational data with a number of international, pan-European bodies working with the educational data of the EU countries, is carried out, for example, to assist graduates in employment issues. In particular, such interaction is carried out with the "Joint Framework Plan for European Digital Competencies" (COST - European Cooperation in Science and Technology: see, for example, the international website of the publisher of statistical collections – (Books.google.ru, n.d.)).

Austria.

1. In Austria, both the functioning of the education system as a whole and the movement of various educational data in it are determined by the national Ministry of Education. Specialized universities are subordinate to a number of line ministries, such as the Ministry of Health, the Ministry of Land, Water, Forest and the Environment, which collect and store primary data on the quality of training of graduates of such universities. The highest regional authority, which in Austria is responsible for teaching students in secondary and special schools (by type: public school, secular school, special education institution), is the Land Council, which collects and accumulates data on the results of this education.

2. The activities of all participants in educational relations in Austria, including the flow of data in the field of education, are based on the School Organization Act (also called the Education Act), adopted in 1962 (Schulorganisationgesetz) and the additions of different years to this law. The field of higher education in the Republic of Austria is regulated, including the collection of relevant data, by the provisions of the University Education Act (Universitaets-Studiengesetz, 1997).



3. In accordance with the norms and principles of the law in the field of education in Austria, all data about students, both personality characteristics and exam results, are collected from educational organizations, taken into account at the “Earth” level and passed on to the National Economic Commission and the Federal the expert council of the Ministry of Education, and the testing results (Nationaltests) - to the appropriate special committee. At the same time, the Land Council is the highest regional body in Austria that collects and accumulates data on the results of studies in secondary and special schools (by type: public school, secular school, and institution of special education). In the field of higher education, control at the federal level, including the collection of relevant data, is carried out in the country by the federal Ministry of Science and Transport. The system of these institutions, which determines, respectively, the data system on the quality of higher education in the country, includes, first of all: colleges (Kolleg) as institutions for teaching a specialty for 2-3 years; universities (Universitaeten) and specialized higher education institutions (Fachhochschule), in particular schools or universities of the arts (Universitaeten der Kuenste) and pedagogical higher schools (Pädagogische Hochschule).

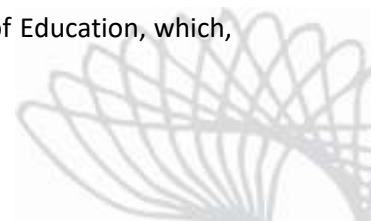
4. Structurally, EDB in Austria is divided into the following parts: 1) data on the learning outcomes and other characteristics of the quality of education in secondary and special schools (by type: public school, secular school, institution of special education), the highest body for generalization of which at the federal level is the Land Council; 2) data on the quality of training of students and graduates (based on the results of exams and tests of various kinds at different stages of training) for the following levels of education and professional training: colleges (Kolleg); Universities (Universitaeten); special institutions of higher education (Fachhochschule).

5. A special committee at the national Ministry of Education determines criteria for compliance with the educational standard for checking graduates, offering them appropriate diagnostic material, while testing, for example, secondary school students qualifies their training in a number of disciplines: German and English, mathematics, economics, law, natural sciences and computer science. Data on the results of such testing, in accordance with the regulation of this process by the law on the organization of schools and additions to it for different years, is collected from schools and generalized at the national level (the results of this generalization are reflected in the statistical data on the results of examinations published annually by the national Ministry of Education. Data on the level of qualification of students in Austria's vocational education institutions are compiled in these institutions using, first of all, the criteria for the quality of education that are similar to those used in Germany: practical versatility, professional suitability of a student, his didactic qualification (Dornmayer, Nowak, 2013) - 2013 research report on the development of the quality of general and vocational education in Germany and Austria).

6. In the same way as in the Federal Republic of Germany, in Austria, educationally significant individual data of students, both personal and exam results at different levels of education, are generated in educational institutions and transmitted further to the regional authorities (for secondary education levels, including special education schools, and primary vocational education), or directly to the appropriate federal authority (as a rule, institutions of different levels of higher education).

7. Under the auspices of the national ministry of education, including in collaboration with other national ministries, students are regularly interviewed to analyze current issues of development at different levels of education. Thus, the results of the relevant polls of recent years, conducted jointly with the Ministry of Economy, indicate that among Austrian youth, education is quite prestigious: of 100% of young people surveyed, 76% in Austria (compared with 62% in Germany and 56% in France) strive to constantly improve their educational level (Bundesministerium für Bildung, Wissenschaft und Kultur, 2005; 2018) - annual reports of the Ministry of Education of the Republic of Austria “Science and Culture” for 2018).

8. Highlighting the priority areas for the use of educational data in Austria, it should be noted that in this country, a special commission on economics has been created under the Ministry of Education, which,



together with the Federal Expert Council and the Land Council, each at its own level, on the basis of studying the data accumulated in the EDB development of the content of accreditation activities and develop decisions that affect the improvement of the quality of training of graduates at a particular educational level in the region or in the country as a whole (The Federal Ministry of Education of the Republic of Austria, n.d.). In addition, in the same way as in Germany, in the Republic of Austria, the data accumulated in the EDB are used to issue information about the results of professional examinations of students (with their consent) to employers from any EU country at their request made to the relevant federal ministry of the Republic of Austria, in order to receive graduates of Austrian institutions of vocational education offers on the labor market in the countries of the European Union (Gruber, 2004); The main role in these interactions on the part of Austria is played by the Ministry of Economy and line ministries, contributing to such a process. In addition, data on students comes for generalization (in order to better ensure the adoption of appropriate decisions in the field of improving the organization of education at the levels of the European Union as a whole or its individual countries) in the European educational bodies working with educational data.

9. As in Germany, the Austrian educational authorities are closely connected with pan-European educational institutions, for example, with COST (European Cooperation in Science and Technology), as well as with OEOD (European Educational Committee for Education and Training) in the framework of assistance to graduates of vocational education institutions in employment, as well as in the framework of cooperation in projects of supranational generalization of educational data of EU countries.

Switzerland.

1. The supreme body coordinating activities in the education system of Switzerland, including with regard to the circulation of educational data, is the State Institute for Education and Culture of the Confederation (Schweizer Medieninstitut für Bildung und Kultur Genossenschaft). The collection of the most generalized data for the country, including data in the field of education, is carried out by the Swiss Federal Statistical Office of Switzerland, which has on its website the section "Education, Science" (The Federal Statistical Office of Switzerland, n.d.).

2. In 2015, the Government of the Swiss Confederation adopted and supplemented in 2017 the state (national or federal) law on education (Bildungsgesetz) on the basis of which the entire system of educational institutions in the country functions (The Swiss federal education system, n.d.), including with regard to the turnover of educational data.

3. Data on the results of education of students at the regional level are collected in the Department of Economics, Education and Science, and at the national level - in the State Secretariat for Education, Science and Innovation as part of the federal educational management body - the State Institute of Education and Culture.

4. Structurally, EDB in Switzerland is divided into the following parts of data on the specifics of various educational programs and a number of characteristics of the quality of educational institutions: data on secondary educational institutions - schools; data on higher educational institutions - universities; data on special universities - pedagogical, medical, musical, artistic and other profile (these data are provided to a wide range of users on a specialized server: Server Hosting Paedagogische - Kunst - Musikhochschulen).

5. Cooperation between the central government and the cantons on the issues of ensuring education and its quality in educational institutions is carried out on the basis of Article 63a. Constitution of the Swiss Confederation, including questions of determining the characteristics of the quality of education, obtaining and using relevant data.

6. Individual data on the results of the education of each individual student (both personal, characterizing, in particular, the level of socialization, and the results of the diagnosis of knowledge, including



the results of school exams), as well as generalized data on these results, are stored in the regional and federal parts of the Swiss EDB (see data on criterion 3 above). However, individual data on the results of professional exams are not so actively and systematically transmitted to interested employers from EU countries, as is done in Germany and Austria, which can be explained by Switzerland's non-accession to the European Union (we could not find relevant information about such activities on a regular basis in information resources, unlike Germany and Austria, confirmation of this trend was also obtained on the basis of a brief interview with the author's business partners living in Germany and having contacts in the field of educational organization in Austria and Switzerland).

7. The main distinguishing features of the procedure for analyzing EDB data and the further practical use of the results of this analysis in Switzerland include, first of all, the organization of such analysis and use of data regarding higher education in cooperation between interregional organizations - the Conference of University Rectors and the Accreditation Council of the Accreditation Agency and quality assurance", while decisions made on the basis of analysis of data on the quality of higher education institutions, both in the cantons and in the country as a whole, are taken collectively by these organizations at a conference of their representatives and are binding on all universities in Switzerland (The Accreditation Council, n.d.).

8. The higher educational institutions of Switzerland, in accordance with traditions originating in numerous pedagogical research and experiments initiated in this country in the 18-20 centuries, actively cooperate, including in the field of data exchange and analysis, with universities in other countries, mainly from Germany, the Netherlands, USA (The Association of Swiss universities, n.d.).

Luxembourg.

1. The main attention in the EDB of this small country today is paid to such a level of education as primary vocational and called higher, but according to its programs implemented in 4 state institutions of vocational education, not exceeding the level of secondary special education and, maximum, the initial course university education (students from Luxembourg learn the further course of higher education, as a rule, in France and Belgium, while in the country there are only attempts to introduce separate full-fledged university programs in newly created private vocational education institutions). This in matters of public administration of education, including the organization of the collection and use of educational data, defines the key role of the Ministry of Higher Education and Research of Luxembourg (MESR) (n.d.), which is responsible for organizing vocational education in Luxembourg (called higher education). MESR is the supervisory ministry of Luxembourg for the country's vocational education institutions and is responsible for the accreditation of training programs leading to the "Higher Technical Specialist" (BTS) certificate, as well as for foreign higher education institutions established in the Grand Duchy of Luxembourg and the training programs offered by by them. Therefore, the HBS system of this country is determined by the activities of the Ministry of Higher Education and Research.

2. There are no own laws of a nationwide orientation in the field of education in small Luxembourg (there are only normative acts at the level of educational institutions). The role of regulatory documents regulating activities in the field of education at the national level, including the rules for the formation and circulation of educational data, is played in this country by international legal acts in force for all countries of the European Union, which includes Luxembourg. In terms of maintaining the EDB, the main such act is the Code of Practice for European Statistics (Code of Practice for European Statistics, n.d.). However, in the aspect of maintaining databases in general, without highlighting the education sector, the country has been in force since 2014, regulating one aspect of such maintenance - the integration of data collected at the state level into a single legal framework.

3. The Luxembourg Institute for Social and Economic Research (LISER), "reformatted" in its current quality in 2014, is a state-owned research institute located in Luxembourg and operated by the Ministry of



Higher Education and Scientific Research. Since 2014, LISER's mission has been to conduct basic and applied research in the field of social sciences aimed at developing knowledge, supporting public policy at both the national and European levels, and informing the public. In accordance with this, LISER is today the main organization in the country that provides the collection of educational data and maintenance of HBS under the guidance of MESR.

4. To perform this function, LISER incorporates a Data Center that supports 2 complementary infrastructures - data collection (direct and indirect data collection), as well as archiving (storage) and data management (including their synthesis, analysis and provision to applicants for use) . The main content of recently tracked educational data by LISER as the main organization in Luxembourg that collects such data is determined by the following research areas of this institute that are relevant for the development of education: "Digital Transformation", "Labor Market" and "Mobility (educational)" . In this regard, the institute joins national and European priorities.

5. The main attention in the EDB of this small country today is given to the quality indicators of such a level of education as higher (which in Luxembourg does not exceed the level of secondary specialized technical education and the initial course of university education in its traditional sense). Moreover, the following indicators of the quality of education are considered as priorities, according to which the MESR coordinates monitoring in relation to the policy of higher education (Higher education institutions of Luxembourg, n.d.): a) Introduction of educational mobility (each student must spend at least one semester as part of the educational mobility program in undergraduate studies); b) Expanding the range of studies in universities; c) The quality of training of higher technical specialists (including, in terms of creating training sites for various specialties); d) The quality of brief training (from 2 to 3 years); e) Direct access of students to the labor market; f) Validation of the acquired experience of students; g) Ensuring the diversity of undergraduate education; h) Expansion of areas of incomplete education.

6. MESR is responsible for the academic and professional recognition of the professional qualifications of each individual graduate, which is provided with the aim of accessing a regulated profession. In this latter area, MESR also implements Directive 2005/36 / EC on recognition of professional qualifications and acts as a national center for assisting graduates of vocational education institutions in finding work in EU countries. In this, MESR collaborates with a specialized organization - BAC, on the website of which there is secured access to the function "Managing Luxembourg Baccalaureate Applications: registering and counting grades and decisions to promote students" - the requested page is available only to authorized users (students, graduates of vocational education institutions and representatives of employers) from Luxembourg, other users access to information on the level of training of a student or graduate is prohibited.

7. Trans-European Association for Political Studies (TEPSA - an international non-profit organization with an office in Brussels, operating in accordance with Belgian law - AISBL), which is the first (founded in 1974) Trans-European research network in the field of European affairs and bringing together 44 leading research institutes from 37 European countries, is actively positioning itself as a participant in the most "trending" areas for the EU countries (corresponding to the tasks of stimulating discussion of educational policy development options) areas of analysis of educational data and advising users on the application of the results of this analysis (The Trans-European Association for Political Studies, n.d.).

8. MESR provides the provision of information services to participants in educational activities regarding all data related to higher education, either directly through its website (to inform university students), or through its partners. So, the MESR partner, the EDP Center, provides its portal to inform students, employees of educational institutions, and other members of the educational community about digital applications, resources and services available to them in terms of familiarizing themselves with new data received regarding the Luxembourg education system (The EDP Center, Luxembourg, n.d.).



9. MESR partners with educational institutions in the country with the following organizations: Luxembourg Institute of Science and Technology (LIST); Luxembourg Institute of Health (ISIS); Luxembourg Institute for Social and Economic Research (LISER); National Research Foundation (FNR). MESR also participates in monitoring studies of educational research at European and international levels. In the field of higher education, he participates in various groups and networks, in particular with regard to the implementation of the strategic framework of the European Union “Education and Training 2020”, with monitoring of the Bologna process and with academic recognition of foreign qualifications related to higher education. MESR represents Luxembourg in the Council on Competitiveness of the European Union, in various councils and committees of the European Research Area, as well as in European program committees, in particular, in the EU research and development framework called “Horizon 2020”.

USA.

1. In the USA, the organization that is the undisputed main “player” in the country’s EDB (unlike, for example, the UK and France EDB systems, in which there are several such “players” and each has its own functions in the EDB) - IES NCES (or NCES) is the National Center for Education Statistics, which is officially the main federal body for the collection and analysis of data related to education in the United States and is part of the US Department of Education (in the scientific plan, it also coordinates its activities with the Institute of Pedagogical Sciences). In this regard, NCES fulfills the mandate of Congress to collect, compare, analyze and present complete statistics on the state of American education, on the preparation and regular publication of reports, reviews and reports on educational activities both in the country and internationally (The National Center for Education Statistics, n.d.). At the same time, the main focus in the work of NCES in conducting national EDB is made in favor of school education at various levels, as well as monitoring of the key educational skills of adults, i.e., in contrast to the other national HBS considered in this study, direct data on quality characteristics in the USA Higher education is not considered in regular HSE projects (this role in the USA is played mainly by universities and colleges themselves, as well as 6 regional associations of several accrediting agencies, each of which focuses on the data on the quality of higher education its different levels, which are recognized in this association, in agreement with universities and colleges, the most relevant at the moment).

The most prominent public partner of NCES today is the National Cooperative on Education after Education (NPEC), which was created with the direct participation of NCES in 1995 as a voluntary organization covering all sectors of the after-school education community, including federal agencies, higher education institutions, associations and other organizations who are very interested in collecting data after secondary education. NPEC’s mission is to “enhance the quality, comparability and usefulness of post-secondary data and information that support policy development at the federal, state and institutional levels.” NCES also established a public organization such as the National Forum on Education Statistics (NFES) to provide improved collection, presentation and use of statistics on primary and secondary education with public participation.

2. The Education Science Reform Act (PL 107-279) is the governing statute for the implementation of NAEP’s NCES. This law provides that the NCES develops and administers the NAEP and informs the public of the results of the implementation of NAEP. According to the law, the National Board of Governors for Evaluation is responsible for scheduling an assessment, developing a framework that provides a content plan and assessment structure, and determining achievement levels. The NCES Management and Budget Office (OMV) has also provided guidance on responsible statistical practices (OMB Statistical Policy Directive N1), which all federal statistical agencies, including NCES, must follow, which collects and analyzes educational information and statistics should be implemented in the USA in such a way that they meet the highest methodological standards, namely, they are timely, objective, neutral and impartial.



Four separate laws cover the protection of the confidentiality of individually identifiable information collected by the NCES - the Privacy Act of 1974, the Education Science Reform Act of 2002, the US Patriots Act of 2001, and the E-Government Act of 2002.

3. NCES itself collects EDB based on an assessment by this National Center in US schools. First of all, such a collection is carried out on the basis of the NAES NCEP assessment of knowledge, skills in a number of subjects every two years in all states, with verification of these subjects at a representative sample for the national level at least every 4 years. Data on different levels of school education in the USA is also collected through other regular studies, such as the additional NCES so-called long-term assessment of performance trends.

4. NCES collects and summarizes information on student performance indicators and adult literacy rates. The National Assessment of Educational Progress (NAEP) is the main NCES program for evaluating what American primary / secondary students know and can do in academic subjects, as well as assessing the ability of adults to perform basic literacy and math tasks - by using the National Adult Literacy Assessment (NAAL). The NAEP, also known as the Nationwide Report Card, is the only national and ongoing assessment of what students in America know and can do in different subject areas. Since 1969, the program periodically assesses reading, math, science, writing, US history, civil law, geography, and art.

5. NCES is authorized to monitor in its activities primarily the following characteristics of the quality of general education: a) the level of formation of knowledge, skills and abilities in reading and mathematics in students of the 4th and 8th grades; b) the level of knowledge, abilities and skills in these disciplines among students of the 12th grade; c) the dynamics of the formation in students over 3-8 years of knowledge, skills in such subjects as writing, science, history, geography, civil law and art; d) the so-called "long-term assessment of trends" in student performance at the age of 9, 13 and 17 years of reading and mathematics.

The National Adult Literacy Assessment (NAAL) program, also implemented by the NCES since 1985, provides a nationally representative and ongoing assessment of English literacy skills among adult Americans, which assesses the following quality indicators for the formation of these skills: a description of the adult literacy status in the United States ; national trends in ensuring the development of these skills; the ability of adults to use their literacy skills in understanding health-related materials and forms; the relationship between literacy and selected adult characteristics.

6. As part of the EDB in the USA, they collect, including those related to the educational activities of students, their individual data - personal information (PII) about students, their performance and their families, for which personal data is strictly protected. A specific provision regarding the protection of information that fundamentally distinguishes the EDB system from educational data circulation systems in other countries considered in this study, especially in the Russian Federation, is the provision that information regarding each individual school in the United States should also remain confidential. Accordingly, in particular, in the US EDB, NCES prohibits the use of NAEP subjects and data for ranking, comparing or otherwise evaluating individual students or teachers, or for providing rewards or sanctions to individual students, teachers, schools or local educational institutions.

7. The NCES annual report program provides for analysis, which summarizes data on various educational topics, to further disseminate the results of this work among users with a view to practical application of these results. NCES itself analyzes the data in the following areas (with the construction of forecasts based on the analysis results): "Statistical analysis, derivation and comparison", "Estimation of deviations", "Rounding", "Table and graphic presentations". In the process of this analysis, the following key conditions are taken into account: the magnitude of the effect, the overall assessment, the frequency of false discoveries (FDR), and hypothesis testing.



From time to time, statistical questions arise in practice that open the basis for expanding the areas of NCES research or even new disciplines in the field of operating with educational data. This happens if an analysis conducted by the staff of the NCES Evaluation Department during a joint analysis with the staff of the Institute for Statistical Education Services revealed a problem. The results of this analysis turn out to be reviewed at a series of NCES workshops with experts invited by the NCES Advisory Board. Another way to identify new necessary areas for the analysis of educational data is the consideration by the National Institute of Statistical Sciences of the relevant proposals generated by the NCES based on a review of the procedures used in the NCES data collections, taking into account the calculation of “response speed” (characteristics of the relevance of the issue).

8. In accordance with the Annual Reporting Program, NCES disseminates the results of the analysis of the collected educational data - using performance reports, tabular reports and web tools. These products include a collection of education statistics, education status, and education statistics forecasts. NCES publishes NAEP results for selected student characteristics, including race / ethnicity, eligibility for the National School Lunch Program (which serves as an indicator of socioeconomic status), and school location. These data are published in official reports and data tools, which allows users to perform their own analysis of the situation in a particular area of American school education. A specific rule established by the above regulatory documents is that the results of NAEP, contrary to the practice adopted in this regard in other countries considered in this study, including the Russian Federation, cannot be used to influence changes in educational standards, curricula or training practices, accepted in the state or in the local community - they serve in this part only as an occasion for a comprehensive study of trends and problems by a wide range of participants at the country level as a whole. In accordance with its standards of operation, NCES produces and releases high-quality products suitable for a diverse audience to users of educational data, while NCES uses a multi-stage process for reviewing its products (including data classes such as editable data, confidential, metadata), using primarily forms of communicating data to the public, such as machine-readable products, review documentation in reports, production and distribution of comprehensive reports and individual data.

9. The National Assessment of Educational Progress (NAEP) is the primary concurrent government program approved by Congress that is monitored and administered by the NCES in collaboration with the US Department of Education and the Institute of Education Sciences to support the HSE in the United States.

Under the International Activities Program (NCES International Activity Program, n.d.), NCES supports various activities to provide statistics for cross-national comparisons in education. On behalf of the United States of America, NCES participates in the International Education Systems Indicators (INES) of the Organization for Economic Co-operation and Development (OECD) program, an intergovernmental organization from 35 member countries. NCES conducts various international assessments and surveys in the United States, which include: 1) Trends in the Study of International Mathematics and Life Sciences (TIMSS), Progress in the Study of International Reading Literacy (PIRLS), and the International Study of Computer and Information Literacy »(ICILS), organized by the International Association for the Assessment of Educational Achievements (IEA); 2) assessments and surveys in accordance with the International Student Assessment Program (PISA), the International Competency Assessment Program for Adults (PIAAC), the International Teaching and Learning Survey (TALIS) and the International Early Learning Research (IELS), organized by the OECD.

Based on the procedures described above in the information on Criterion 7. In particular, NCES is currently implementing a software development and testing program in several areas related to the analysis of complex sample survey data and statistical methods for protecting confidential data.

Japan.



1. In Japan, like the United States, there is an organization that is officially the central link in the country's HBS system - the State (National) Institute of Education, now renamed the National Institute for Educational Policy Research (NIER NOW, n.d.), working in collaboration with the supervisor of NIER NOW Department of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and is a comprehensive national educational policy research institution authorized by MEXT to regularly collect, process and present to the state and society research results planned by NIER NOW together with MEXT.

2. In its activities, NIER NOW is guided by the Regulation on the Administration of Administrative Documents of the Ministry of Education, Culture, Sports, Science and Technology, which, in accordance with the classification of regulatory documents adopted in Japan, has the status of a state law on the management of official documents (Law No. 66 of 2011 years) and includes the norms for the movement of data reflected in documents recorded at the state level of education management.

3. The main source for the formation of the HBS in Japan is the analysis of the NIER NOW educational data that he collects on the basis of his research on issues relevant to educational policy planning. The organizational form for such data collection is the so-called "Research Project" - this is a research activity that is aimed at studying the problems that are important for the development of education, which should be addressed as part of the administrative policy in the country. To carry out this activity, NIER NOW organizes project teams with the participation of researchers inside and outside the institute. The study period is from 2 to 5 years.

4. The content of the data collected in the EDB of Japan and the corresponding indicators (characteristics) are determined by the following areas of research conducted by NIER NOW in the framework of breakthrough research projects in education (the so-called "Reiwa 1", "Reiwa 2", etc.): a) the influence of the environment of pre-school education and child care institutions, parent-child relations of parents and relations between parents and the child on the subsequent development of children (to determine a useful perspective for improving measures to support the upbringing of children and primary school systems); b) a survey of primary schools, including questions about educational policy, educational institutions, the environment, curricula; c) education policy and evidence in the field of education in the UK and the USA; d) the impact of educational policy on society; e) evidence of the inclusion of state educational policy in the work of local governments; f) evidence collected in schools; g) empirical verification of the formation and improvement of the curriculum at school; h) conducting multifaceted studies of the types of literacy required in the coming era; i) studies of educational development trends in foreign countries and practical research in various scientific and pedagogical schools; k) management of the curriculum aimed at developing personal qualities and abilities, and the measures necessary to improve it - according to studies in the country and abroad; l) educational innovations in accordance with the progress of advanced information technologies, including the following positions: organization of exams using advanced information technologies; clarification of the conditions for promoting educational innovations in accordance with the progress of advanced information technologies; development technologies using advanced information technologies; m) child safety in the school space; n) reserves of educational policy regarding the placement of teachers in educational institutions; o) current trends in the development of personality from high school students to higher education (from the point of view of the students' parents).

5. The main characteristics of the quality of education considered in the framework of the above-mentioned breakthrough areas of NIER NOW data collection: a) the development of the qualities and abilities necessary in response to modern challenges that appeal to scientific literacy, citizenship and the ability to use information, including programming skills; b) the quality of knowledge in the field of science, social science and geographical history; c) characteristics of the quality of development of social and emotional (non-cognitive) abilities among schoolchildren and students (in order to better use the capabilities of the environment to improve these abilities).



6. The collection of individual data related to education in the EDB system of Japan, formed mainly by NIER NOW, takes place as part of the implementation of the above research areas and is more a by-product of the functioning of this EDB. However, this does not mean that such data does not disappear - it is carefully stored, updated in the OBL and used not only for analysis, generalized for entire groups of students, but also for tracking the development dynamics of the respective students in the interest of improving the pedagogical support of their personal formation (with consent parents of these students). In accordance with this, for example, as part of a study by NIER NOW to study the quality of the learning process from early childhood (from 3 years to a primary school student in the second year of study in it), the following recommendations are implemented for all groups of participants in this study: “Continuously research the same child for 5 years. Participants who participated in the survey for young children will be offered a survey of academic abilities (national language / mathematics) for first-graders in primary schools (5 schools) in which they were enrolled. To confirm the connection between the results of the interview and the study of academic abilities, some elementary school students (1-2 schools) will be tested for the development of cognitive skills and social (emotional) skills (test results will be presented in the form of quantitative indicators)”

7. In accordance with the above regulatory documents, the following areas of analytical activity, provided or directly carried out by NIER NOW, are clearly defined: a) contributing to the planning and development of strategic educational policies in the medium and long term based on research with in-depth data analysis and forecasting of the future educational situation in Japan and abroad, in order to find the ideal educational policy in Japan; b) scientifically based analysis of the problems of the social background of education and the current situation in educational policy, which must be urgently addressed; c) the desire for the widest possible breadth of areas of analysis in each field of education.

An example of materials produced by NIER NOW for school workers based on the analysis of data collected by NIER NOW is (NIER NOW, 2018).

8. Also, in accordance with the above regulatory documents, priority areas for ensuring the use of educational data by the company by NIER NOW are also identified: a) such a contribution to the planning and development of educational policies that provides a flexible response to the needs of society, based on its interests in the field of education; b) conducting consultations on the results of the collection and generalization of educational data for interested users of these data; c) systematization of stored information related to education to ensure that it is provided to partners in Japan and abroad and, further, facilitating the exchange of information about education and research with relevant organizations in Japan and abroad, as well as expanding knowledge about the subject of research through joint research, conferences and other international events.

9. The set of projects implemented by NIER NOW on a regular basis for the quality of maintaining the EDB of Japan includes the following priority national projects in this area: a) Basic and applied research for planning the best educational policy; b) Basic research in the field of higher education, carried out by organizing project teams, in which researchers are widely involved inside and outside the university; c) Study of various businesses and joint projects for the development of education; d) The study of the provision of the inhabitants of the country with equal opportunities in obtaining compulsory education; e) Verification of the results of education and the problems that affect them; f) Study of the quality of teaching aids; g) Studies intended for schools on the implementation of curricula; h) A project to improve the skills of leaders of social (non-formal) education to ensure the revitalization of activities in this field of education (in cooperation with the Ministry of Education, Culture, Sports, Science and Technology); i) National study on the status of educational achievements; l) A survey of the status of implementation of training manuals; m) A study of the quality of instructional materials, textbooks, reference materials for assessing learning outcomes; n) Curriculum Research Designated School Business.



Also for these purposes NIER NOW implements the following international cooperation projects: a) in the framework of cooperation with the International Association for the Assessment of Educational Achievements (IEA) - first of all, the International Study of Trends in Mathematical and Natural Education (TIMSS); b) in the framework of cooperation with the OECD, in the first place: the Student Achievement Survey (PISA), the International Viability Survey (PIAAC), the International Educational Survey for Teachers (TALIS) and the Survey on Early Childhood Care and Child Care Workers organized by OECD.

Kazakhstan.

1. Among all the countries represented in this study, the Republic of Kazakhstan is the only one in which the concept of "OBD" is institutionalized - by creating in 2013 and ensuring the regular functioning of the information system "National Education Database" (NOBD) (n.d.), designed to ensure automated collection of departmental education statistics. At the same time, the model of organization of HBS in Kazakhstan is built using features implemented in the United States (in terms of determining the institution that is the main body in charge of EDB of the country and administratively subordinate to the state educational authority) and in Japan (in terms of delegating almost all functions in the field of maintaining EDB of the country the only institution, while in the United States, the main body necessarily carries out its activities in collaboration with a number of public organizations). Such an institution, which is the main agency in charge of EDB in Kazakhstan, is the Information and Analytical Center Joint Stock Company - IAC JSC (IAC, n.d.), subordinate to its sole shareholder - the Ministry of Education and Science of the Republic of Kazakhstan (MES RK) and managed by the Board of Directors AO.

2. The regulatory documents directly regulating the activities of IAC JSC as the organization responsible for the formation and functioning of the EDB in the country are the Charter of IAC JSC and the Corporate Governance Code of IAC JSC, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated 17.07. 2019 N309.

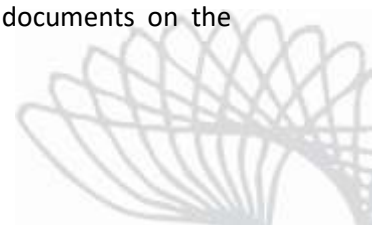
3. In the NLB, the data collection carried out by IAC JSC is automated and is carried out according to the chain: "organization of education - local education department - regional education department - MES RK".

4. Data collection in the NLB is carried out in the following sections: a) OECD; b) International comparative studies; c) Preschool education and training; d) Secondary education; e) Technical and vocational education; f) Higher education Monitoring of program documents; g) Educational statistics.

5. The characteristics of the quality of education, taken into account in the NLB, are mainly taken from the characteristics of the quality of school education used in such international studies as PIRLS (International Study on the Quality of Reading and Understanding of the Text), PISA (International Program for the Assessment of Educational Achievements of Students), TIMSS (International study of the quality of mathematical and science education), as well as, in terms of adult education, PIAAC (assessment of skills and competencies of able-bodied adults).

6. The formation of the NLB in terms of individual data of students is carried out by IAC JSC as part of activities to maintain a complete record of students. This activity is regulated, in connection with which it is carried out in relation to each student in the education system of the Republic of Kazakhstan, to ensure guarantees for every citizen of the country access to compulsory education, to stimulate the educational activity of students and to take into account their educational achievements when planning their further education, in order to increase the effectiveness of training and education of children and youth.

7. Analysis of the data accumulated in the NLB is carried out by IAC JSC in the preparation of the following documents: materials requested by the structural units of the Ministry of Education and Science of the Republic of Kazakhstan with statistical data necessary for these units to work; documents on the



dynamics of the development of the national education system (at the request of the Ministry of Education and Science of the Republic of Kazakhstan); various unregulated reports prepared on the instructions of the Ministry of Education and Science of the Republic of Kazakhstan in the framework of current activities; annual national collection "Statistics of the education system of the Republic of Kazakhstan" (National Educational Database (NLB) of the Republic of Kazakhstan, n.d.).

8. The use of NOBD data is carried out in accordance with the tasks established by the aforementioned by the IAC Code, first of all, this is the formation of administrative reports; providing structural divisions of the Ministry of Education and Science of the Republic of Kazakhstan with the necessary statistical data for work; data replenishment for maintaining a complete record of students; ensuring the procedure for the automated filling in of Passports of educational organizations; the formation of a historical series of statistical data (for fixing the dynamics of the development of the national education system); in addition - the formation of unregulated reports (on the instructions of the Ministry of Education and Science of the Republic of Kazakhstan). The ubiquitous dissemination of statistics on the development of the education system through the publication of the national collection "Statistics of the Education System of the Republic of Kazakhstan" (2016) was also ensured.

9. In addition to participating in international research projects, at this stage IAC JSC together with the Ministry of Education and Science of the Republic of Kazakhstan is considering the issue of ensuring the compliance of national education statistics with international standards, in accordance with which administrative data reports are being prepared for transmission to the Committee according to statistics of the Ministry of National Economy of the Republic of Kazakhstan and filling out the annual UNESCO questionnaires.

The Russian Federation.

1. In the Russian Federation, a single, centralized EDB system has not yet been created, and therefore the HBS in Russia is among the EDB of all countries considered in this study, the most distributed among different bodies and organizations, therefore, participants in the formation and functioning of the EDB in this case are almost all municipal, regional, federal educational authorities and other public authorities, their subordinate institutions and educational organizations of various levels of general and professional education - each of these bodies and organizations is currently the ultimate holder of one or another part of the educational data that is significant for EDB regularly accumulated, but only to a small extent and irregularly flowing through vertical links to all higher levels of education management (which is obvious from a comparison of the content of sites of educational organizations and sites of bodies of different levels of education management). However, among all the organizations participating in the HBS system in the Russian Federation, one can still single out the one that is currently the most specialized in terms of the formation and functioning of the EDB, although it also has only a small part of all data that is significant for use in the formation of the state management policy in education (at least on the basis of comparison with data sets in the centralized body of EDB of other countries). This is the Federal State Statistics Service (Rosstat), among the sections of its statistics database that has the Education section (Education, n.d.).

2. If we take into account the regulatory framework in relation to the maintenance of state statistics in general, without taking into account the regulation of EDB, in the Russian Federation there is one of the most detailed regulatory systems in the world: the Federal Law of November 29, 2007. N282-Ф3 "On official statistical accounting and the system of state statistics in the Russian Federation"; Decree of the President of the Russian Federation dated April 3, 2017 N 141 "On Certain Issues of Improving Public Administration in the Field of Official Statistical Accounting"; Regulation on the Federal State Statistics Service (Decree of the Government of the Russian Federation of June 2, 2008, N420); Regulation of the Federal State Statistics Service (Order of the Federal State Statistics Service dated November 27, 2012 N618); Decree of the Government of the Russian Federation of August 18, 2008 N620 "On the terms of compulsory provision of



primary statistical data and administrative data to subjects of official statistical accounting”; Decree of the Government of the Russian Federation of May 26, 2010 N367 "On a single interdepartmental information and statistical system." To regulate the maintenance of HBS in the Russian Federation, Rosstat issued Order N705 of November 29, 2018, “On Approving the Official Statistical Methodology for Calculating the Basic Indicators of Education and Culture Statistics”.

3. In accordance with the norms of these acts, the subjects of official statistics that collect and compile official statistical information on educational organizations are: in the part of pre-school, general and secondary vocational education programs, the Ministry of Education of the Russian Federation (n.d.), and in part basic vocational training programs, educational programs of higher education and additional professional programs - the Ministry of Science and Higher Education of the Russian Federation (n.d.), the activities of which are also regulated by Federal Law dated 29.12.2012 N273-Φ3 “On Education in the Russian Federation”.

4. The content of indicators monitored regularly and publicly on the Rosstat website in terms of EDB is significantly inferior in its completeness to the content of indicators, information on which is regularly updated, analyzed and communicated to all participants in educational relations in other large countries: on this website only the following 3 sections of data can be found, which testifies to the small structure and small completeness of the data (the content of which also comes down to exclusively formal characteristics that do not affect the assessment of the quality of education, indicators of problems that need to be addressed within the framework of the state education policy, and in general in any way allowing the use of data to improve the state education policy - these characteristics are limited by the amount of budget expenditures on education, the number of educational organizations of various types and the number of students studying in them, as well as the number of those or other levels of education knowledge available in a given age group of the population): a) Preschool education; b) General education programs, educational programs of secondary vocational education, educational programs of higher education; c) Programs for the training of scientific and pedagogical personnel in graduate school and the training of scientific personnel in doctoral studies.

6. There are no individual data on students or other participants in educational relations in the described part of the EDB of the Russian Federation.

7. The analysis of official data in the described part of the EDB of the Russian Federation periodically (based on federal research grants) is usually carried out by the Institute for Statistical Studies and Economics of Knowledge of the National Research University - HSE (together with the Ministry of Education and Science of Russia, the Ministry of Education of Russia and Federal State Statistics Service). The result of the analysis is short statistical compilations on education statistics published by Rosstat together with the Higher School of Economics (Education in numbers: statistical compilation, 2019).

8. Regarding the regular, systematic use of official data in the described part of the HBS of the Russian Federation and also regarding the regular implementation of state projects in this area, theoretical studies are currently being conducted mainly (Fiofanova, 2020b; 2020c).

5 DISCUSSION AND CONCLUSIONS

According to criteria that are important for the analysis of the construction, functioning of educational statistics databases in various countries and reflecting the technological processes of assembly, initial analysis, structuring and exchange of information in the EDB system of a specific country.



According to criterion 1. Distribution of EDB by bodies, organizations, institutions conducting different parts of EDB has many options in different countries, but it tends, in the process of its development, to centralization and coordination of key issues not only with state authorities in the field of education, but also with the public.

According to criterion 2. Not every large country has its own state legal act regulating the functioning of EDB, including the collection, analysis and use of educational data, but this does not always affect the development of the EDB system in the country. Often, the developed activities of the EDB system are quite successfully built on the basis of the law of a more general subject matter in the field of education, as well as a specialized international legal act.

According to criterion 3. The sources of educational data in the EDB system of a particular country are built according to one of the following 2 options: 1) sending data on vertical links, from each educational organization to the corresponding national authority; 2) data collection directly by the leading EDB at the national level by the organization, based on its relevant research.

According to criterion 4. The composition, structuring and relationships of educational data in the EDB system of a particular country reflect the country's comprehensive characteristics and are characterized by the greatest diversity compared to other criteria of the analysis conducted in this study.

According to criterion 5. The main indicators of the quality of education, taken into account in the EDB system of a country, reflect, on the one hand, the specifics of problems and resources for the development of the education system in a particular country, and on the other hand, international trends. At the same time, the depth of elaboration of the system of accounting for data on the quality of education in EDB reflects the general level of its development in a particular country.

According to criterion 6. Using the data of individual educational achievements of students in the HBS system of a particular country, on the one hand, is characterized by a common approach, consisting in the synthesis of promoting the maximum realization of the personality in the education system based on the implementation of an individual approach with the confidentiality of relevant data, on the other hand, varies in the degree of use of such data in OBD (from active to zero) depending on the development of the OBD system in the country. Moreover, the creation of a unified national system of digital portfolios of individual educational achievements of students is a little developed activity in comparison with other areas of activity within the framework of the HBS of the countries considered.

According to criteria 7. The directions of analysis and use of data stored in the EDB of a particular country differ in the wider range of forms, the more developed is the activity on the formation and functioning of EDB in a particular country.

According to criterion 8. At the same time, there is little in common between countries in relation to such forms, which suggests that the exchange of experience and its generalization with the determination of the most optimal algorithms in this area is in the world only at the initial stage.

According to criterion 9. Relations with national and supranational projects and programs implemented in the HBS system of a specific country are built, depending on the degree of EDB development in the country, either entirely around the "standard set" of large international projects, or also using national government projects and programs, taking into account the specific tasks and problems of the education system in a particular country.

According to the research aspects.

Features of the construction and use of EDB in countries that historically have the greatest experience in this, belonging to well-known leaders in the field of educational innovations (Great Britain, USA, Germany,



France, Japan), are distinguished by a wide range of characteristics of the quality of education, taken into account, analyzed in such EDB and regularly used to improve educational policies.

The formation and use of databases in the educational systems of both English-speaking and German-speaking countries is to a small extent determined by the commonality of the language, culture and, to a greater extent, by the historical traditions of the public administration system in education, and by the general level of development of science and economy in the country (in connection with which a decision is made to participate in international projects), as well as membership in supranational associations (which determines the use or disregard of the relevant general rules of activity).

The construction and use of the EDB depends on the size of the country and its economy, and therefore the regulation of EDB in “small” countries tends to fully borrow norms from legal documents of “large” or from international legal documents.

Relatively (in comparison with other countries considered in the study), the least use of educational statistics to form decisions in the field of education management is characterized by the EDB of the Russian Federation, while in this EDB any characteristics of the quality of education, as well as individual data suggesting them are completely ignored placement in a single portfolio of digital portfolios.

Additional information analyzed on such a criterion as the reflection of educational data in public reports and / or reports of schools, educational authorities, partners of educational organizations (parent, professional associations, scientific institutions) in the EDB system of a particular country. The following conclusion was stated, which is common for the EDB systems of the countries considered (more precisely, for the informational representation of these systems in publicly available sources). With regard to the principles of organizing educational databases and their use at the level of the country as a whole, its regions, supranational associations of countries, as well as at the level of using individual data to improve professional selection, a large body of information is presented in the literature and Internet sources reflecting the results of relevant studies. , indicating, inter alia, the search for common approaches to the construction of such databases and their use at these levels. In comparison with this, information on the search for uniform approaches to the reflection of educational data and the results of their analysis at the level of educational organizations, therefore, on their websites (in accordance with the term “public report or report on the quality of education” that has been used, for example, in the Russian Federation) schools, municipal educational authorities) and the use of such data by parent associations, professional associations, scientific institutions in the indicated sources in relation to foreign countries, unlike the Russian Federation, is not presented to the extent that would allow one or another generalization (moreover that in Russia there are widely available data from both research and methodological developments (Fiofanova, 2020)). In widely available sources on the practice of using educational data abroad in terms of such use, for example, by various professional associations, information is also presented only in the aspect of a generalized consideration of data, at the country level as a whole or at the inter-regional level (a case in point is that specific intra-school achievements, problems and their solutions only on the scale of their “publication” for users at the regional level and above: information collections of the annual General Swiss Conference of Regional Leaders in the Field of Educational Work - see journal. Perhaps this aspect of data movement between education systems and their social partners in the aspect of international practice requires research with less “surveyed”, more “implanted” methods, using focus group interviews.

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REFERENCES

- The Accreditation Council. (n.d.). Retrieved from: <https://www.berufsberatung.ch>
- The Association of Swiss universities. (n.d.). Retrieved from: <https://www.swissuniversities.ch>
- Books.google.ru. (n.d.). An international website for an Internet resource that publishes, among other things, statistical collections in the field of education in different countries. Retrieved from: <https://books.google.ru/>
- Bundesministerium fur Bildung, Wissenschaft und Kultur. Information. (2005).
- Bundesministerium fur Bildung. Wissenschaft und Kultur. Information. (2018).
- Dornmayer, H., Nowak, S. (2013). Lehrbidungsausbildung in Forschungsbericht, No 176.
The EDP Center, Luxembourg. (n.d.). Retrieved from: <http://www.education.lu/>
- Education in numbers: statistical compilation. (2019). Moscow: HSE.
- Code of Practice for European Statistics. (n.d.). Eurostat. Retrieved from: <http://ec.europa.eu/eurostat/quality>
- The Federal Ministry of Education of the Republic of Austria. (n.d.). Retrieved from: <https://www.oefg.at>
- The Federal Ministry of Education and Science of Germany. (n.d.). Retrieved from: <https://www.bmbf.de>
Education. (n.d.). The Federal State Statistics Service – Rosstat. Retrieved from: http://old.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/education/
- The Federal Statistical Office of Switzerland. (n.d.). Retrieved from: <http://www.bfs.admin.ch/bfs/portal/fr/index/themen/15.html>
- Fiofanova, O.A. (2020a). Analysis of the current state of research in the field of education management based on data. *Values and Meanings*, 1, 71-83.
- Fiofanova, O.A. (2020b). “Big Data in Russian Education: Data Analysis Methods in Education and Human Development, Digital Data Services”, in: R.V. Ershova (ed.), Materials of the International Conference “Digital Society as a Cultural and Historical Context of Human Development: From Digital Culture to Cyber Culture”, February 12-14, 2020, Kolomna. Kolomna: State Social and Humanitarian University.
- Fiofanova, O.A. (2020c). Methods of analysis of educational data and methods of their application in pedagogical and managerial practice in the field of education. *School technologies*, 1, 117-127.
- Fiofanova, O.A. (2020d). Smart Big Data in public reports: evidence-based education management and evidence-based educational policy. *Educational Policy*, 5, 1-13.
- Fiofanova, O.A., Bokova, T.N., Morozova, V.I. (2020). International Comparative Analysis of National State Electronic Educational Platforms for School Children. *Revista Inclusiones*, 7, 51-61.
- Gruber, E. (2004). “Berufsbildung in Österreich: Einblicke in einen bedeutenden Bildungssektor”, in: F. Verzetnisch, et al., Jugendliche zwischen Karriere und Misere: die aktuelle Situation der Lehrausbildung in Österreich: Innovation und Herausforderungen. Wien: ÖGB.



Higher education institutions of Luxembourg. (n.d.). Retrieved from: <https://cedies.public.lu/fr.html>
IAC. (n.d.). The Information and Analytical Center Joint-Stock Company, Kazakhstan. Retrieved from: <http://iac.kz/ru/about>

Kananykina, E.S. (2013). German Education Management System. *Administrative Law and Administration Practice*, 7, 100-136.

The Directorate of Evaluation, Forecasting and Performance. (n.d.). Ministère de l'Éducation Nationale et de la Jeunesse. Retrieved from: <https://www.education.gouv.fr/publications-rapports-et-statistiques-286058>

The French unit Eurydice. (n.d.). Ministère de l'Éducation Nationale et de la Jeunesse. Retrieved from: <https://www.education.gouv.fr/eurydice-reseau-europeen-sur-les-systemes-educatifs-3182>

Inspectorate of Education, Sports and Research. (n.d.). Ministère de l'Éducation Nationale et de la Jeunesse. Retrieved from: <https://www.education.gouv.fr/mission-et-organisation-de-l-inspection-generale-de-l-education-du-sport-et-de-la-recherche-41687>

The National Security Supervisory Board and the availability of educational institutions in France. (n.d.). Ministère de l'Éducation Nationale et de la Jeunesse. Retrieved from: <https://www.education.gouv.fr/l-observatoire-national-de-la-securite-et-de-l-accessibilite-des-etablissements-d-enseignement-89561>

The Supreme High Council of France. (n.d.). Ministère de l'Éducation Nationale et de la Jeunesse. Retrieved from: <https://www.education.gouv.fr/le-conseil-superieur-des-programmes-41570>

Digital education at a school in Europe 2019. (2019). Ministère de l'Éducation Nationale et de la Jeunesse. Retrieved from: <https://www.education.gouv.fr/etudes-et-statistiques-1145>

The Ministry of Culture of the State of Hesse. (n.d.). Retrieved from: <https://www.kulturministerium&Hessen.de/schulsystem>

The Ministry of Education of the Russian Federation. (n.d.). Retrieved from: <https://edu.gov.ru/about>

The Ministry of Higher Education and Research of Luxembourg. (n.d.). Retrieved from: <https://mesr.gouvernement.lu/fr/le-ministere.html>

The Ministry of Science and Higher Education of the Russian Federation. (n.d.). Retrieved from: <https://minobrnauki.gov.ru/ru/activity/statan/stat/index.php>

The National Center for Education Statistics. (n.d.). USA. Retrieved from: <https://nces.ed.gov/about/>

National collection "Statistics of the education system of the Republic of Kazakhstan". (2016). Astana: JSC Information and Analytical Center.

National Educational Database (NLB) of the Republic of Kazakhstan. (n.d.). Retrieved from: <https://e.edu.kz/ru/statistics.html>

NCES International Activity Program. (n.d.). Retrieved from: <https://nces.ed.gov/surveys/international/>

NIER NOW. (n.d.). The National Institute for Educational Policy Research, Japan. Available: https://www.nier.go.jp/now/index_r01.html

NIER NOW. (2018). A collection of examples of instructions for improving the management of evidence-based learning (based on the results of the National Study of Academic Achievements. State of Learning).



Pisareva, L.I. (2012). Education Management in Germany: Traditions and Innovations. Internet-journal "Problems of Modern Education", 3, 60-78.

The State Statistical Service of the Government of Great Britain. (n.d.). Retrieved from: <https://gss.civilservice.gov.uk/>

Statistisches Jahrbuch 2006 für das BRD. (2006). Wiesbaden: Statistisches Bundesamt.

The Swiss federal education system. (n.d.). Retrieved from: <https://www.bildungssystem.educa.ch>

The Trans-European Association for Political Studies. (n.d.). Retrieved from: <http://www.tepsa.eu/about/what-is-tepsa/>

UK Department of Education website. (n.d.). Retrieved from: <https://www.gov.uk/government/organisations/department-for-education/about/statistics>

UK Office of National Statistics website. (n.d.). Retrieved from: <https://www.ons.gov.uk>

The Code of Practice for European Statistics in the UK State Statistical System. (n.d.). UK Statistics Authority. (n.d.). Retrieved from: <https://www.statisticsauthority.gov.uk/code-of-practice/>

The Office for the Regulation of Statistics in the UK. (n.d.). UK Statistics Authority. Retrieved from: <https://www.statisticsauthority.gov.uk>

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