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FACTORS AFFECTING THE QUALITY OF EDUCATION GIVEN THE NEW INNOVATION SPHERES OF ECONOMY

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Abstract: The relevance of the chosen research stems from various changes in modern society, in particular, an increasing role of education in social development (including in human life), contributing to higher standards of educational quality. Therefore, interest in the issues of educational quality assurance continues to grow each year steadily. In part, this may be attributed to the substantial role of educational institutions in professional staff training and education of the next generation, which is having a major impact on the development of the country as a whole.

It is certainly important to investigate factors affecting the quality of education in view of the fact that a person can get an education both independently and within a specially organized process at the educational institution.

This paper describes a methodology that identifies factors affecting the quality of education subject to modern economic and educational trends. The author has attempted to make a typology of any identified factors, developed a model of factors affecting the quality of education, as well as identified issues relating to the identification of factors associated with the quality of education.

Keywords: the quality of education, factors affecting the quality of education, typology of factors, economic trends, trends in education.

Introduction

A distinctive feature of modern global development is the rapid emergence of various trends in different fields of human activity: in the economy, education, etc. Such trends have an impact on our lives. For example, the emergence and development of new spheres of economy promote the emergence of new professions; the digital

transformation of education imposes requirements for the basic skills of the XXI century (competences) necessary for a modern person, etc. Moreover, this, in turn, imposes certain requirements on the quality of education.

Below is a list of some economic and educational trends.

The Global Education Futures and World-Skills Russia experts' report "Skills of the Fu-

ture. What you need to know and be able to do in the new complex world” (*Report of experts from global education futures and world skills Russia “Skills of the Future”*, 2018) focuses on six trends in modern global development, which are key, according to the authors of the report. They are:

- technological development: digitalization of all spheres of life, automation and robotics;
- technological and social transformations: globalization and ecologization;
- societal transformations: demographic shifts and emergence of a network society.

At the same time, one general trend (the so-called metatrend), which influences all the others, is identified as acceleration.

Related to these trends, new spheres of activity are emerging and developing that focus on the realization of human creative potential: cyber economics, creative economy, human-centred services, environmental sphere, and the new technology sector (*Report of experts from global education futures and world skills Russia “Skills of the Future”*, 2018).

Another part of the Global Education Futures report, “Education for a Complex Society” (*Global Education Futures Report “Education for a Complex Society”*, 2018), focuses on megatrends that shape not only our future in general but the future of our education, in particular: digitalization, automation, transformation of social institutions, demographic shifts, and transition towards sustainable societies. In accordance with these megatrends, new spheres (sectors) of the economy are being emerged:

- smart technological sector;
- personalized services sector (human-centred services);
- virtual economies sector;
- knowledge creation sector (scientific knowledge);
- Eco-regenerative (green) economies sector.

In addition to various economic trends listed above, we can also indicate some global economic trends in the modern global social and technogenic development (Demidenko & Dergacheva, 2016):

- wide expansion, defence and propaganda of the global capitalist social developmental system without taking into account certain specifics (national, historical);

- formation of global scientific and technological productive forces at the expense of the planet’s natural and biosphere resources;
- destruction of the biosphere and its degradation;
- formation of social and technogenic (anthropo-technogenic) circulation and destruction of the biosphere-biotic circulation;
- growth of technosphere as an artificial non-living material and electromagnetic (field) world (technosphericization of the planet);
- strengthening of technocratism and technogenic social progress;
- growth of the collective human mind (Noos);
- deepening of social and technogenic global development;
- formation and deepening of socio-techno-natural development (globalization).

Various studies published on the website of the National Center for Public-Private Partnership, within the national project “Digital Economy”, emphasized the following priority sectors of the economy and social sphere (Sidoryuk, 2020):

- digital industry;
- digital healthcare;
- digital construction;
- digital energy;
- transport and logistics;
- digital agriculture;
- financial services;
- smart cities;
- education.

The transformation of modern education as a sphere of economy is one of the key positions. The report identifies three priority directions of education development (Kuzminov, Orekhin, & Netreba, 2020):

- available lifelong education;
- prevention and correction of educational failure;
- available modern higher and secondary vocational education.

It also states the need to create an effective system of additional education and stimulate the system of continuing adult education and lists the provisions for improving the quality of education by overcoming certain existing barriers (Kuzminov, Orekhin, & Netreba, 2020):

- digitalization of educational institutions, crea

- tion of a domestic network for available technologies;
- providing educational institutions with any necessary material and technical base;
- introducing/expanding legislative opportunities in accordance with the existing needs and improving the regulatory framework;
- creating conditions (regulatory and organizational) for the implementation of the educational program;
- targeted funding for programs to improve the quality of educational institutions, etc.

Identifying trends that influence the future of education.

Overall, having analyzed various sources, we were able to identify one of the main trends in education - the use of digital technology in education (the so-called digitalization of education).

The use/introduction of digital technology in education is primarily aimed at the development of certain qualities (knowledge, skills, and competencies) in students. Today's society is deemed to impose the following requirements on any employee (regardless of his/her qualifications):

- to have solid training (natural sciences and humanities);
- to have skills (possession of competences of the twenty-first century);
- to have knowledge, skills and abilities in specific areas (high level of mathematical, digital literacy; analytical, critical, and creative thinking, etc.).

The digital transformation of education involves the formation and spread of new operating models for educational institutions based on the synthesis of new effective (high-impact) teaching practices, continuous professional development of teachers, new digital tools, information sources and services, organizational and infrastructural conditions for the required changes (Kuzminov, Orekhin, & Netreba, 2020).

- All of the above suggest the basic requirements for modern education in the context of global digitalization (including its quality):
- continuous updating, the actualization of educational standards, development of new methods, an adaptation of educational materials to the needs of teachers and students;
- development of communication skills, functional, information (IT-literacy) and digital literacy among teachers and students;

- creating conditions and ensuring equal access to education for everyone;
- individualization of education (personalized teaching, focus on the needs of a particular student);
- close interconnection of science and practice (including pedagogical one), exchange of experience, sharing the best pedagogical practices;
- the increasing motivation of both teachers and students.

To summarize, the main trends of the education market in 2021, which also influence the quality of education, are the following:

- Micro-learning and "small achievements" (bite-size learning concept) - short practical programs, short online master classes;
- intensive targeted learning using digitalization;
- personalized approach (flexible learning system);
- applied nature of teaching to develop new applied skills (competencies that allow quick and effective adjustment to new conditions, adaptive learning);
- customization - matching teaching to the needs of students (development of necessary, certain skills);
- artificial intelligence and machine learning (use of cognitive self-learning systems).
- Trends in modern education are:
 - globalization;
 - the continuous learning process (a lot of new professions appear, and the acquired skills quickly become obsolete).

It is worthwhile to note that the problem of education quality is topical at any time. At the present time, the so-called time of innovations, the time of digital economy development, a huge number of various types of research are carried out (Martin, 2017; Martin & Parikh, 2017; *Education planners, search no more*, n.d.). The requirements for the present-day workforce and, accordingly, for the graduates of educational organizations are being updated. The present time is the time of trans-professionals and innovators (*Industry 4.0: Building the digital enterprise*, 2016; *Skills in the digital economy: Where Canada stands and the way forward*, 2016; *World development report 2016: Digital dividends*, 2016; *Russia 2025: From personnel to talents*,

2017; Bezruchko, Shatrov, & Maksimova, 2018; *New foundational skills of the digital economy*, n.d.; Götz & Jankowska, 2020; *Digital transformation in Russia – 2020: Overview and recipes for success*, 2020; *Future of jobs: Report 2020*, 2020; Pritula, 2021; Dondi, Klier, Panier, & Schubert, 2021).

Current State of the Problem

Quality in the modern world is understood in very different ways and is a complex category which can be viewed from different perspectives: philosophical, social, technical, legal, economic, etc.

Since quality is viewed as a complex category from different perspectives listed above, the concept of “the quality of education” can be viewed from the same perspectives.

International, interstate and national standards understand quality as compliance with the requirements (products, services) and the ability to satisfy the consumer (Standards, 2021).

The pedagogical dictionary defines “the quality of education is a certain level of knowledge and skills, mental, moral and physical development, which students achieve at a certain stage in accordance with the intended purposes; the level of matching the expectations of various stakeholders involved in education from the educational services provided by the educational institution. The quality of education, first of all, is measured by its compliance with the educational standard” (Kodzhaspirova & Kodzhaspirov, 2000, pp. 56-57).

Moreover, the quality of education is understood as “consistency of education (as a social system, process, and result) with diverse needs, interests of an individual, society, and state; a

systemic totality of hierarchically organized, socially significant essential properties (characteristics, parameters) of education (as a social system, process, and result)” (Kodzhaspirova & Kodzhaspirov, 2000, p. 88).

“The quality of education is a set of characteristics of competencies and professional consciousness reflecting the ability of a specialist to be engaged in an occupation in accordance with the requirements of today’s economic development, at a certain level of efficiency and professional success, with an understanding of social responsibility for the results of professional activity” (Korotkov, 2007, p. 78).

We will focus on these definitions when identifying the factors affecting the quality of education.

We should emphasize here that many factors exist now that affect the quality of education (there is a great variety of such factors) in connection with certain (outlined) above realities of global development and the potential for economic development (emergence of various trends that determine our future), including the potential for development of modern education.

The use of digital technologies in education is one of the main directions, as noted above, which is actively developing. In this regard, in order to ensure the quality of education, both teachers (pedagogues, educators) and pupils (schoolchildren, students) must have certain digital skills (competencies).

Current Trends

As a result, a list of the most important competencies of an individual living in the twenty-first century is defined as a set of competencies that fall into four groups (Fig. 1) (Uvarov, 2014).

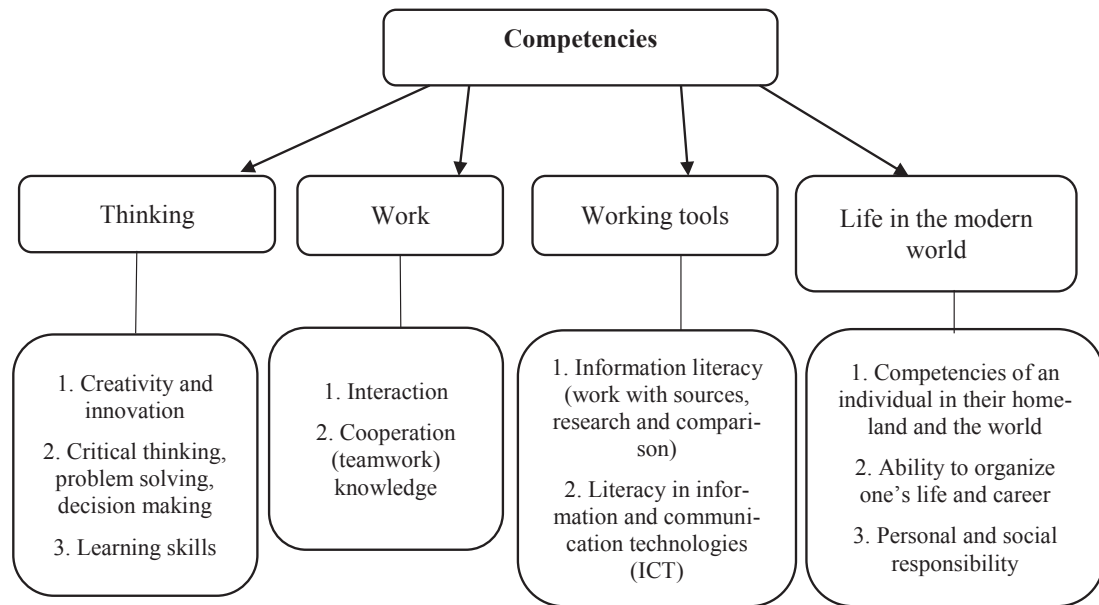


Figure 1. Competencies of an Individual Living in the Twenty-First Century (Uvarov, 2014, p. 15).

Groups of digital skills necessary for both a teacher and students in 2021 have also been identified (*Digital literacy of Russians: Research 2020, 2020; Report of experts from global education futures and world skills Russia "Skills of the Future"*, 2018):

- digital (including information) security;
- creation of digital content;
- knowledge of all high-tech devices;
- problem-solving skills in the digital environment;
- data handling (in particular, the Data-Driven approach);
- contextual/specialized skills, cross-contextual skills, existential skills (adaptability, self-learning, teamwork);
- digital etiquette.

In accordance with the listed and demanded competencies to ensure the quality of education, it is necessary for the teacher himself/herself to possess such competencies. We may describe this factor as the teacher's professionalism (competence). Thus, the education of teaching staff is one of the key factors influencing the quality of education.

Research Methods

The study proposes to view the factor as a mate-

rial fact, a cause that affects the quality of education and the driving force for improving the quality of education in today's environment. In order to determine the factors affecting the quality of education, a methodology for identifying the factors was developed. The proposed factors-identifying methodology can be used in further research work to identify factors affecting the quality of education.

Methodology for identifying factors affecting the quality of education.

The methodology used to identify factors affecting the quality of education consists of three components (stages): the preparatory period, basic and final stages.

1. Preparatory period:

- 1) to examine the category, the "quality" concept, "the quality of education" concept;
- 2) to consider new emerging economic spheres and new economic trends (in terms of modern researchers);
- 3) to identify trends affecting the future of education, defining existing potential in the private education market;
- 4) to identify risks of digital transformation of education.

2. Main stage:

- 1) to research (study) existing factors affecting the quality of education:
 - a) to review literary sources and research

- findings;
 - b) to have experience in different educational organizations;
 - 2) to select a group of methods to identify factors affecting the quality of education:
 - a) to make observations, surveys (interviewing, questioning), and review documents;
 - 3) to define the indicators of identified factors for the purpose of further monitoring;
 - 4) to make a typology of factors affecting the quality of education.
 - 3. Final stage:
 - 1) to outline the problems of determining factors affecting the quality of education;
 - 2) to make conclusions and recommendations.
- Based on the proposed methodology, the research (study) of the existing factors affecting the quality of education was carried out in accordance with the basic stages of identifying factors affecting the quality of education in the new emerging spheres of economy, taking into account the private education market potential:
- 1) defining the criteria (indicators, values) for identification of factors affecting the quality of education;
 - 2) factors search and identification;
 - 3) evaluation of the identified factor's relevance (degree of impact, effect);
 - 4) typology of identified factors (determination

- of typological features);
- 5) identification of the main (basic, relevant) factors;
- 6) description of identified factors and their impact on the quality of education;
- 7) description of conditions having an impact on the factors affecting the quality of education.

Results

Typology of factors affecting the quality of education.

As there is no single universal typology in any scientific field (for example, typology of research, typology of conflicts, etc.), so there is no single universal typology (classification) of factors, including factors affecting the quality of education.

Below we described one of the typologies for factors affecting the quality of education, depending on the selected typological feature. It was compiled based on the data obtained when using the proposed methodology for identifying the factors.

1. In general, factors affecting the quality of education can be divided into two large groups: external and internal factors (Table 1). These groups of factors are important for both traditional (offline) and distance (online), as well as mixed (offline plus online) learning.

Table 1.

Factors Affecting the Quality of Education
(Compiled by the author)

<i>External factors</i>	<i>Internal factors</i>
<ul style="list-style-type: none"> – global – government – economic – political – social – cultural – legal – demographic – psychological – technological 	<ul style="list-style-type: none"> – Education objective and strategy – responsibility (interest) of the management (administration of the educational institution) – content of education (including educational programs) – Quality management system of an educational institution – working and learning conditions – orientation towards the quality of training (personnel, students) – motivation (of students, teachers and other staff categories at an educational institution) – educational and methodical, informational, material and technical support – level of training of the teaching staff and other employees of the educational institution – level of competence of university entrants and students – arrangement of the educational process (tools, methods, teaching technologies, etc.) – psychological climate in teams and groups of students

Global factors and globalization include the influence of international processes in higher education and the demand for higher education in the global community.

Issues of organizational and legal support, regulation, control and management of education by a particular state, etc., are referred to the public factors.

Economic factors, including financial factors, are responsible for the provision, equipment of the educational process, and financing of education.

A group of political factors includes various political decisions in the education system development, for example, the decision on education digital transformation decision to switch to a distance format of work during the coronavirus pandemic.

Social factors mainly imply meeting public needs in education and the demand for quality education. Cultural factors assume the existing need for higher education and the relationship between culture and the level of education in the country.

Sometimes, these two factors are combined and viewed as sociocultural factors, implying social attitudes to the effect of changes in the educational system on our daily lives and addressing the arising social problems.

Legal factors imply legal support of the education quality (legal regulation of social relations in education, legal guarantees for the quality of education): state educational standard, licensing of educational activity, state attestation and accreditation. We can either combine these factors with a group of state factors or consider them separately.

A group of demographic factors considers the composition of the population - age, quantitative representation - and deals with age characteristics of consumers of the educational services, in particular.

External psychological factors include, for example, the current pandemic coronavirus situation, which entailed an online learning format and determined the willingness to teach and learn remotely.

The development/support of the technological base that creates conditions for informatization (digitalization) of education in a particular country refers to technological factors.

Besides the above group of general external factors, we can identify a group of individual external factors, which include the following:

- the emergence of a large number of competitors (including private educational institutions);
- the state development strategy;
- rapid development and application of innovative technologies (students' need for such technologies has proved to be growing);
- solvency of educational services consumers;
- legislation changes;
- consumer preferences (preferences of educational service consumers);
- or even the geographical location of the educational institution (they often go to enrol in the capital educational institutions, although there is a reasonable opinion that the Russian Federation territorial educational organizations provide better and more qualitative training).

A group of internal factors affecting the quality of education is very extensive.

The quality of working conditions includes the arrangement of a teacher's workplace.

Under the quality of working conditions, we understand not only payment and a comfortable workplace but also the possibility of career advancement, ensuring social guarantees.

The motivation of both teachers and students affects the quality of education. Different systems of allowances are developed and applied to maintain the motivation of teachers in educational institutions.

There is some specificity of factors affecting the quality of education, which manifests itself in different types of learning.

For example, internal factors that determine the quality of distance learning (including online learning) include:

- policy of educational institutions in this field;
- level of professional skills of teachers in the e-learning environment;
- appropriate resource provision (financial, personnel, material and technical, etc.);
- level of teaching process structuring;
- quality of electronic learning materials;
- individual approach (individualization of education);
- absence of adverse impact on the students' health.

2. All factors affecting the quality of education can be divided depending on the level of their manifestation (level of implementation):
 - at the level of the state;
 - at the level of the educational institution;
 - at the division/Department level;
 - at the level of a specific employee (teacher, administrative employee, etc.) or student.
3. Depending on the level of influence on the educational process, we distinguish the main factors (most important) and secondary (least important).

This division of factors is conditional as each person (stakeholder involved in education, a party concerned) will have an individual set of significant and insignificant factors depending on his/her priorities.

4. The following other groups of factors can be identified subject to an individual's existing priorities (attitude to the work performed and purpose of professional activity):
 - personal factors: mood, health, well-being, desire to teach and transfer knowledge, personal sympathies, antipathies, etc.;
 - professional factors: competence of the teacher, ability to quickly "readjust" the lesson for a group of students, their perception, possession of varied pedagogical and other methods, different forms of classes, etc., talents and capabilities of a particular teacher.
5. Global and local factors are distinguished as to the extent (scale) of the impact.

Also, global factors can be considered at the level of the entire global community: general - at the level of the state (in education), individual- at the level of a particular educational institution, specific - at the level of a particular division / Department or teacher (student, teaching and support staff, administrative staff, employer, parent, and graduate).

6. We can identify a group of factors of prevailing circumstances or a group of unexpected (unforeseen) factors: stress, fatigue from the number of classes during a day, deterioration

of well-being; a group poorly understanding information and a new topic (often introduction into the course is quite monotonous: goals, objectives, principles of the subject, etc.).

7. Factors depending on the level of quality control:
 - level of Rector (Rector's office);
 - level of the Dean's office (faculty, department);
 - level of the Department;
 - level of the teacher;
 - level of the student;
 - level of the graduate;
 - employer level;
 - parent level.
8. Depending on the type of learning used in educational institutions:
 - factors affecting the quality of traditional (face-to-face) learning;
 - factors affecting the quality of distance learning;
 - factors affecting the quality of blended learning.
9. According to the impact nature:
 - direct impact factors;
 - indirect impact factors.

Direct impact factors include educational institutions' ratings, requirements of employers, requirements of parents and requirements of former students and now graduates who started their carrier and faced certain difficulties and conditions.

Among the indirect impact factors, there is the attitude to the specifics of teaching work, health, etc., in the family.

The division into direct and indirect impact factors is conditional, as practically any factor can be referred to as both groups of factors depending on its importance for the persons involved in education.

Below, we present some of the factors affecting the quality of education and their indicators from the point of view of the persons involved in education (Table 2).

Table 2.

Factors Affecting the Quality of Education, and Their Indicators from the Point of View of the Stakeholders Involved in Education (Compiled by the author)

<i>Factors</i>	<i>Indicators</i>
Quality of the Faculty members' activity (professional)	

-
- commitment to their academic subject(s);
 - quality of training aids;
 - knowledge, abilities, skills, experience and qualification (teacher’s professional competence);
 - quality of reading materials;
 - ability to learn new things, to study;
 - quality of the developed and suggested practical exercises for the students;
 - teacher’s workload during the academic year (number of classes per day, number of courses, including those that are new for the teacher, per year, etc.);
 - quality of classes (quality of teaching);
 - abilities and preferences for a particular science;
 - quality of training (not getting a “wallpaper degree”, but actual training, mastering additional program (re-training), upgrading of professional skills program, etc.);
 - interest in scientific (research) and pedagogical activities;
 - quality of interaction (at different levels: teacher-student, teacher-teacher, teacher-administration, teacher-academic staff, etc.);
 - constant self-education, self-development (learning, upgrading the professional skills) in accordance with the modern requirements for the courses taught;
 - quality of communication (students note that quality of teaching depends on the way they contact the teacher);
 - motivation to work;
 - quality of research (scientific articles, monographs, patents, receiving patents, etc.);
 - personal qualities;
 - other.
 - other.
-

Quality of students’ study (learning)

-
- interest in the scientific (research) work and learning, to their future practical (professional) occupation;
 - quality of knowledge acquired;
 - learning load (number of courses, number of tests, etc.);
 - gaining practical experience;
 - motivation for learning (self-study, self-development, and further self-education);
 - interest in future work;
 - students’ abilities and readiness for diverse activities (but given, sometimes, their preferences for a certain sphere of labour activity, for studying certain courses in accordance with the chosen future occupation);
 - quality of interaction (at different levels: student-teacher, student-student, student-administration, student-support staff, etc.);
 - personal qualities;
 - quality of research work (articles, graduate qualification works, etc.);
 - other.
 - other.
-

Quality of the administration, support and other staff performance (professional)

-
- Interest in work;
 - quality of managerial decision-making;
 - involvement in work, interest in labour results;
 - quality of decisions made;
 - knowledge, skills, experience, and qualification;
 - quality of orders and instructions;
 - commitment to self-development and career growth;
 - quality of management at different levels;
 - interest in the development of educational institutions;
 - quality of document flow (and, accordingly, documentation) in the educational institution;
 - labour motivation;
 - quality of interaction (at different levels: administration - teachers, administration - support staff, support staff - support staff, etc.);
 - ability to be responsible (as a separate essential quality);
 - other.
 - knowledge of teaching specifics (this is important both for evaluating/monitoring the quality of teaching and for making various management decisions);
 - personal qualities;
 - other.
-

Questions to Be Discussed

A wide variety of typological (classification) features, which distinguish the factors affecting the

quality of education, makes it possible to present the typology of factors in the form of a model (Fig. 2) in general.

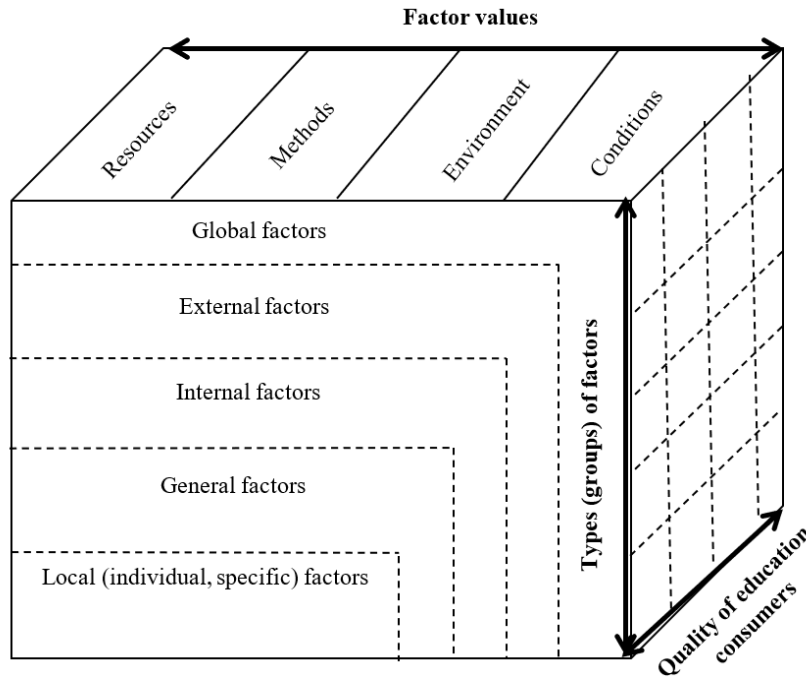


Figure 2. Model of Factors Affecting the Quality of Education (Compiled by the author).

Factor values: resources (labour (personnel), intellectual, technological, financial, informational, material), methods (algorithm of actions, process controllability), environment (external and internal), and conditions (development of new spheres of economy, education market potential; public and private educational institutions, where the education is carried out, etc.).

Quality of education consumers (educational service):

1. external: a state (customer), employers, colleagues (if the work is interrelated), parents (relatives, guardians) of students, graduates (former students), other educational institutions (master's program, postgraduate training, additional education);
2. internal: students, fellow students (in teamwork), subdivisions of the institution - departments (training in another department in master's degree, postgraduate study), teachers (other courses), and personnel of the institution (educational departments and other insti-

tutional divisions).

The range of factors simultaneously affecting the quality of education is wide: from completely insignificant and secondary (minor, local) factors to the most relevant and global.

Conclusion

When determining the factors affecting the quality of education, we found some challenges in identifying these factors and compiling a typology thereof.

One of the challenges in determining (identifying) the factors is the lack of a united, universal opinion about the quality of education. Sometimes, we can even talk about the lack of agreed opinion between all the stakeholders involved in education and other stakeholders (teachers, students, employers, graduates, parents, etc.).

This also relates partly to different perceptions of the quality of education among different

people according to their individual (subjective) opinions.

The second challenge relates to a constant change of conceptions of the quality of education and requirements to the quality of education, which changing environmental situation (in the economy, science, technology, etc.) dictate. Here we can talk not only about specific and general opinions about the quality of education (inconsistency of opinions) but also about changing conditions for education (for example, the emergence of online education, the emergence and “multiplication” of various platforms and services for their use in learning, the idea of creating educational hubs, etc.).

Another challenge is today’s rapid global obsolescence of knowledge and, at the same time, of certain professions. This process is so fast that now they often say that a person has not yet had time to complete his/her studies and the profession is no longer in demand; or has he/she just completed the studies and new knowledge already appeared that must now be mastered independently, while the knowledge acquired during the training in an educational institution is already outdated.

Thus, even a high-quality education can make the graduate no longer in demand in the labor market.

We can also identify some difficulties caused by the lack of a single typology of factors affecting the quality of education (almost all fields of science demonstrate the lack of a single universal typology). This is partly explained by the great diversity of existing factors.

As a result, we note that ensuring the quality of education in the educational institution is a joint work (professional work) of teachers, students, administration, employers, etc.

Given the outlined challenges of identifying factors affecting the quality of education, there is no doubt we will continue our further research on the issues of quality assurance in educational institutions.

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