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Research paper

Information and Advisory Environment in Education: Organizational and Technological Perspectives

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Abstract

The article outlines the key components of a high-quality information and advisory environment within an educational institution. Tasks are grouped, and the functions and principles for organizing the creation and development of effective learning in the information and advisory environment of an educational institution are prescribed. The role of cloud technologies in expanding the potential of an educational institution's information and advisory environment is demonstrated. An experimental study at the ascertaining stage found that the vast majority of respondents were not sufficiently ready to use the information and advisory environment; they lacked knowledge, skills, motivation, and abilities. Therefore, we have developed a set of necessary and sufficient pedagogical conditions and proposed innovative methods through which the selected components of an educational institution's information and advisory environment foster fruitful cooperation, operate in interrelation, and contribute to the high-quality provision of educational services. At the formative stage, in the experimental group, unlike the control group, a more significant and statistically significant increase was observed in all criteria corresponding to the components, which allowed us to say that the developed methodology, which was based on certain authorial pedagogical conditions for increasing the level of educational services and organizing an information and advisory environment, is quite effective in an educational institution.

Keywords: *Cloud Technologies; Educational Institutions; Functions and Principles of Organizing the Creation and Development of Effective Learning; Information and Advisory Environment; Set of Pedagogical Conditions.*

1. Introduction

Education is essential to society's cultural enrichment and socio-economic development, equipping people with the skills and knowledge to be productive amid ongoing global growth. The task of organizing the training of each individual in the education system, and of effectively providing knowledge that is transformed and forms a new information mindset for all stakeholders, is relevant.

The popularity of electronic educational resources, the openness of educational systems, the growth of the level of computer skills of subjects of the educational process, the rapid development of information technologies, the transparency of educational systems, the virtualization of educational activities, the transition to a new, active form of fixing the results and process of educational activities, the need for contacts of social partnership and information interaction have actualized the problem of development and formation of the information and advisory environment of an educational institution and require changes in approaches to the organization of the educational process in educational institutions.

In the modern education system, Internet technologies are widely used, including modern systems, interactive whiteboards, software, multimedia platforms, and more. These changes have also led to the emergence of several factors that underscore the need to modernize the educational process and create an information- and advisory-based environment using the latest information and communication technologies. The formation of an information and advisory environment in an educational institution requires not only the institution to invest intellectual and material resources, but also teachers and students to contribute their psychological, intellectual, and physical resources.

Today requires a high level of specialist education, a new way of thinking, intelligence, professional mobility, communication speed, and digital competence.
All peoples, communities, and individuals should be able to fully realize their potential, improve their quality of life, and promote sustainable development, in accordance with the principles and purposes of the Charter of the United Nations and the Universal Declaration of Human Rights, while being supported and fully respected [1].
Successful modernization of educational systems through ICT is possible when modern projects are implemented. Creating a single information and advisory environment for an educational institution is one such project that will provide adequate support for specialists in their professional development [2].

2. Literature Review

The development of innovative potential and the improvement of the education system through the modeling and design of information-educational, information-consultative, and information-communication educational environments are being considered by scientists from different countries.
Lokhvytska & Martovytska [3] considers the information-consultative environment of an educational institution in which, in accordance with the individual needs of participants in the educational process, flexible configuration of technologies and services (development and use of electronic educational tools, distance learning courses) is ensured, which is important in the conditions of modern distance interaction; shows the role of the site as an electronic representative of an educational institution on the Internet, which serves as a component of the information-consultative environment of an educational institution.
Roth [4] identifies the structural and organizational features of an educational institution's information and advisory environment and outlines its properties and functions.
Lauer & Peschel [5] revealed the features of the principle of hierarchy in the process of building an information and advisory environment of an educational institution, identified the features of its content and distribution, in particular, described the subordination of lower-level elements to higher-level elements, which provides a logical connection between them and involves building a system that integrates and encompasses several subsystems as elements.
Recent studies emphasize the growing role of virtual environments as spaces for professional learning and advisory interaction. Cotton et al. [6] investigated the effectiveness of a virtual learning environment designed for early- and mid-career agricultural professionals across Fiji, Pakistan, and the Philippines. Their findings demonstrate that synchronous online collaboration enables meaningful cross-cultural exchange, shared problem-solving, and the development of professional relationships. The study confirms that virtual environments can function as effective advisory platforms by facilitating in-depth discussions and collective reflection. However, while the authors underline the pedagogical value of collaborative participation, less attention is paid to the organizational frameworks and advisory structures that sustain such environments over time, particularly in institutional educational contexts.
The organizational dimension of educational environments is further addressed in the context of entrepreneurship education. Gródek-Szostak et al. [7] argue that modern entrepreneurship education should foster multidimensional entrepreneurial competencies, combining knowledge acquisition with creativity, social responsibility, and workplace adaptability. A key factor in achieving this goal is cooperation between academic institutions and business environments, which function as advisory and support systems within the educational process. This perspective highlights the importance of external advisory actors in shaping educational environments. Nevertheless, the technological mechanisms through which such advisory cooperation is mediated – particularly digital platforms and information systems – remain insufficiently elaborated.
Earlier work by Gródek-Szostak et al. [8] focuses on the transformative impact of information and communication technologies on learning spaces. The authors emphasize that digital tools, such as interactive computers, enhance student engagement and interactivity. Their study describes the implementation of a free operating system that supports the permanent installation of educational software, simplifying teachers' work and strengthening institutional support through partnerships with advisory committees. While this research provides valuable insights into technological implementation, it primarily addresses technical and instructional aspects, offering limited analysis of how such technologies contribute to a holistic information and advisory environment at the organizational level.
The concept of a digital educational environment is systematically explored by Henseruk et al. [9], who identify it as a key condition for developing future teachers' digital competence. The authors define the structural components of a digital educational environment and analyze international experiences of its implementation. They stress that effective digital environments require modern IT infrastructure, electronic communication tools, and digital content accessible to all participants. Although this study highlights the strategic importance of institutional infrastructure, the advisory dimension – including guidance, support services, and decision-making mechanisms within digital environments – receives comparatively less attention.
From a more human-centered perspective, Semenikhina et al. [10] examine the formation of academic culture in a digital creative environment. They conceptualize academic culture as an integrated personal characteristic encompassing critical thinking, academic integrity, scientific communication, and digital literacy. The authors define a digital creative environment as a space that combines digital tools, intellectual systems, and contextual pedagogical experience to support creative self-expression. This approach broadens the understanding of educational environments beyond technology, yet it largely focuses on individual development, leaving the organizational and advisory mechanisms of such environments underexplored.

2.1. Research gap and contribution

A review of recent scholarly literature demonstrates growing attention to digital educational environments and the use of information and communication technologies in higher education. However, existing studies predominantly focus on isolated technological tools or instructional practices, while the systemic organization of an information and advisory environment at the institutional level remains insufficiently explored. In particular, prior research lacks integrated models that simultaneously address pedagogical conditions, organizational mechanisms, and technological infrastructure within a single conceptual framework.
Moreover, empirical validation of such environments is limited. Most available studies adopt descriptive or conceptual approaches and do not provide experimental evidence demonstrating how the structured organization of an information and advisory environment influences participants' readiness for digital interaction, satisfaction with advisory services, or the overall quality of educational provision. This gap directly informed the objective of the present study, which was to design and experimentally verify a methodology for organizing an information and advisory environment in an educational institution.

Another significant gap concerns the absence of standardized evaluation criteria. The literature rarely offers validated indicators for assessing the effectiveness of information and advisory environments, making cross-study comparison difficult and limiting the generalizability of findings. To address this limitation, the current research developed a set of clearly defined criteria and indicators (systemic, interaction readiness, and satisfaction-based) and tested them empirically. This approach underpins the study's hypothesis that the implementation of targeted pedagogical conditions would result in statistically significant improvements in the organization and effectiveness of the information and advisory environment.

Accordingly, the key contribution of this study lies in providing empirically grounded evidence that a systematically designed information and advisory environment, supported by specific pedagogical conditions, leads to higher levels of digital readiness, interaction efficiency, and user satisfaction compared to traditional institutional practices. By directly linking identified research gaps to the study's objective and hypothesis, the findings advance current knowledge and offer a transferable methodological framework for the digital modernization of educational institutions.

3. Methodology

3.1. Research design

The study has a mixed (quantitative–qualitative) design and is aimed at theoretical substantiation and experimental verification of the effectiveness of organizing the information and advisory environment of an educational institution. The methodological basis was the systemic, competency, activity and information and technological approaches, which ensured the consideration of the studied phenomenon as a holistic pedagogical system focused on improving the quality of educational services.

3.2. Research participants

The study was attended by 112 people, including 78 higher education applicants and 34 teachers of higher education institutions of Ukraine. The formation of the experimental (EG) and control (CG) groups was carried out by the method of paired comparison, taking into account the specialty, level of digital preparedness and conditions of the educational environment, which ensured the representativeness and comparability of the sample.

3.3. Stages of the experimental study

The experimental study was conducted in three stages. At the preparatory stage, the relevance of the problem was determined, the goal and objectives of the study were formulated, scientific sources were analyzed, and a toolkit was developed. The ascertaining stage involved diagnosing the levels of readiness of participants in the educational process to use the information and advisory environment and assessing the state of its functioning. At the formative stage, the developed methodology for organizing the information and advisory environment was implemented in the experimental groups, while in the control groups, training was carried out according to the traditional model.

3.4. Tools and methods of data collection

To collect empirical data, questionnaires, testing, pedagogical observation, self-assessment, and expert evaluation were used. The author's questionnaires were aimed at determining the levels of readiness for information and advisory interaction (motivational, cognitive, and activity components) and the level of satisfaction of participants in the educational process with the functioning of the environment. The validity of the tools was ensured by their testing and expert evaluation.

3.5. Evaluation criteria and indicators

The effectiveness of the organization of the information and advisory environment was assessed according to three groups of criteria: systemic (interactivity, openness, integration of the environment), the criterion of readiness for interaction (motivational, cognitive and activity indicators) and the criterion of satisfaction of participants in the educational process (forms of information organization, educational content, organization of the educational process). The levels of formation were defined as high, sufficient and low.

3.6. Methodology implementation procedure

At the formative stage of the experiment, a set of pedagogical conditions was implemented, which included the training of teachers and students in the use of digital and cloud technologies, the introduction of multi-channel consulting services, interactive forms of support and digital feedback tools. The methodology was integrated into the educational process without violating the curricula and organizational structure of educational institutions.

3.7. Statistical analysis methods

Empirical data processing was carried out using mathematical statistics methods. To test the statistical significance of the differences between the experimental and control groups, Student's t-test and Pearson's χ^2-test were used. The level of statistical significance was defined as $p \leq 0.05$ and $p \leq 0.01$. Calculations were performed using the Statistics software package, which ensured the reliability and validity of the results obtained.

3.8. Ethical considerations

The study was conducted in compliance with generally accepted ethical principles of pedagogical and social research. All participants were informed about the purpose, procedures and conditions of participation in the study and provided voluntary informed consent. Participation in the study was completely voluntary, and respondents had the right to refuse participation at any stage without negative consequences.
The anonymity and confidentiality of the participants' personal data were guaranteed. The collected data were used exclusively in a generalized form for scientific purposes. The study did not involve any interference in the educational process that could harm the participants and met ethical standards of academic integrity.

3.10. Limitations of the study

Despite the results obtained, the study has certain limitations. First, the study sample was limited to higher education institutions in Ukraine, which may affect the generalizability of the results to other educational systems or cultural contexts. Second, some of the empirical data is based on self-assessment methods, which may contain subjective distortions of respondents' answers.
In addition, the study covered a limited time period, which does not allow for a full assessment of the long-term impact of the organization of an information and advisory environment on the professional development of teachers and the educational outcomes of students. Further research may be aimed at expanding the sample, using a longitudinal design, and involving additional objective indicators of effectiveness.

4. Results and Discussion

4.1. The main components of the high-quality functioning of an educational institution's information and advisory environment are. tasks and functions of organizing the creation and development of effective learning in the information and advisory environment of an educational institution

The current task of education is to create a modern learning environment that enhances professional preparedness, develops key competencies, and fosters long-term competitiveness.
Key components of a high-quality educational information and advisory environment include:
1) A well-rounded student capable of self-realization and professional growth.
2) A technologically equipped, inclusive, and innovative environment supporting lifelong learning.
3) Innovative teachers who integrate theory and practice with creativity [11].

The implementation of computer-oriented technologies is crucial for improving education quality and facilitating:
- Removal of territorial barriers via distance and independent learning.
- Better education quality through broader information access, objective monitoring, and transparency.
- Cost reduction and resource reallocation to human capital and institutional modernization.
- Faster management of educational processes through automation and ICT tools [12].

Effective ICT use requires consultants and network coordinators who provide guidance, create the advisory environment, and manage telecommunication projects.
Main tasks for developing an educational information and advisory environment are:
- Integrating services into a unified advisory and information space.
- Meeting students' ICT-related educational needs.
- Enhancing the educational, methodological, and technical base.
- Ensuring continuous learning in remote or hybrid settings.
- Improving methodological and informational support for institutional management [13].

A well-organized environment supports advisory, professional development, interactive, diagnostic, and methodological functions [14]. It fosters information culture, creative development, and competence for students, teachers, and administrators, while enhancing professional and social adaptation, consultation services, and overall quality and accessibility of education [15].

4.2. The role of cloud technologies in expanding the potential of the information and advisory environment of an educational institution

The institution's cloud technologies significantly expand the scope and potential of the educational information and advisory environment by enabling the exchange of management, information, resources, and materials through public clouds. A more reliable resource for data integrity and cybersecurity is private clouds, which significantly accelerate interactions and provide quick access to relevant services and consultants [16].
Web technologies in the information and advisory environment of education – technologies for using web resources located in the web space and creating methods and software and hardware integrated for effective processing of web resources (virtual environments, sites, models, activities, events) for consulting.
Automated library and information systems are designed to automate library processes – information resource management technologies at all stages of the life cycle, automation of library and bibliographic basic processes based on the use of computer technology, modern information and communication technologies, and telecommunication networks.
Innovative educational hubs in the information and advisory environment of education, created for joint special activities, where there is an opportunity to quickly and effectively accumulate intellectual potential, acquire competence, and develop regardless of gender and age.
SMART technologies create an interactive educational and advisory system within the educational environment, enabling editing, creation, and distribution of information in multimedia formats, ensuring adaptation to the needs of consultants and users, and providing automated support.
Automated document flow systems in the information and advisory environment of education include information systems and technologies that support the management, creation, distribution, and access to electronic documents, as well as their control.

Interactive technologies that provide pedagogical interaction in a dialogue mode in the information and advisory environment of education [17]. Their varieties include group work technologies and virtual [18].
Technologies for monitoring the quality of the information and advisory environment of education – technologies for systematization, organization of targeted activities for collecting, summarizing, storing, and using information on development trends and the state of the subjects of the educational process.
Applied computer-oriented pedagogical technologies for advisory support in the information and advisory environment of education provide: interactions and personalized feedback, round-the-clock pedagogical support, variation in the volume of the information supplied; providing consultations to individuals, expanding the range and means of advisory services, interactivity, dynamism, consulting; increasing the capacity of individual support, the ability to combine information and advisory resources of educational institutions.

4.3. Principles of organizing the information and advisory environment of an educational institution

The main principles of organizing an educational institution's information and advisory environment are:

- Openness – free access to resources for all participants and fostering active partnerships.
- Purposefulness – clear goals, methodological and organizational foundations, and alignment with institutional development.
- Accessibility – ensuring users can use resources, with adaptation, pedagogical support, and counseling.
- Integration of learning and counseling – professional development, career guidance, and support for teaching staff.
- Integrity and systematicity – a unified, coherent environment.
- Dynamism – flexible development, forecasting changes, and adopting new methods and technologies.
- Flexibility – continuous updating of methods, tools, forms, content, and materials.
- Gamification – applying game elements to motivate engagement, competition, and self-expression.
- Safety – creating secure conditions for study and work [20].

Modernizing education through this environment enhances information culture, advisory support, and learning efficiency, enables personalized learning trajectories, and fosters responsible, socially active, and creative specialists [21].

4.4. The content of the experimental work

The preparatory stage of the experimental study enabled us to determine the topic's relevance and the study's purpose. At the theoretical level, at this stage of the experiment, the need to create an information and advisory environment in educational institutions was emphasized, its advantages, software features were determined, a system of information and advisory environment was built, and criteria for assessing the effectiveness of the organization of the information and advisory environment were substantiated.
The ascertaining stage of the experimental study enabled substantiation of the theoretical analysis of sources on the problem of forming an information and advisory environment in educational institutions. During the ascertaining experiment, the task was set: to clarify the purpose and content of organizing an information and advisory environment in educational institutions through the processing of work experience; to determine the criteria, indicators, and levels of organizing such an environment; to develop the conditions for organizing an information and advisory environment in educational institutions.
At this stage of the study, teachers' and students' positions on organizing an information and advisory environment in educational institutions were clarified through questionnaires and interviews, and the state of the problem of organizing such an environment in educational institutions was examined. The structure of the information and advisory environment in an educational institution is revealed, which includes a social component (consists of the socio-cultural environment of the subjects of the environment and themselves, ensures the development of students' needs for advisory assistance); a subject component (includes the spatial design of the environment, which enables the behavior of the subjects of the environment and the necessary spatial actions in receiving and providing information and advisory services); a pedagogical component (to implement the goals of the environment, it includes methodological support for innovative activities).
The criteria for the effectiveness of the organization of the information and advisory environment in an educational institution are substantiated:

- System criterion (indicators: interactivity, presence, immersiveness, openness, integration of the environment).
- Criterion of readiness for interaction of education seekers in the information and advisory environment (indicators: activity, cognitive, motivational).
- Criterion of the level of satisfaction of education seekers with the functioning of the environment (indicators: satisfaction with the forms of information organization, the capabilities of the environment, educational content, organization of the educational process).

The established criteria enabled education seekers to monitor the state of the environment's functioning using indicators at high, sufficient, and low levels.
The conducted survey of education seekers and teachers revealed difficulties in understanding the essence of the information and advisory environment of the educational institution:
39% of education seekers and 59% of teachers use the institution's information and advisory environment. The following factors cause such low use:

- Insufficient level of ICT proficiency of education seekers and teachers (teachers have − 59% average and 15% high level of ICT proficiency; education seekers have − 50% average and 9% high level of ICT proficiency).
- Insufficient awareness of the possibilities of the information and advisory environment of education seekers and teachers (37% of teachers and 38% of education seekers are informed).
- A large percentage of students and teachers see shortcomings in the field of education in informational consulting (45% of teachers and 28% of education seekers).
- A low percentage of those who use ICT tools to engage in self-education (teachers – 50% of all and 13% of education seekers).
- Satisfaction with the organization of the information and advisory environment of the institution is 30% among teachers 25% among education seekers.

The vast majority of respondents are consulting clients: teachers are 46% and education seekers are 77%.
Let's name the forms of informational consulting used by teachers:

- Implementation of teacher training programs – 18%.
- Research advisory services – 18%.
- Filling educational platforms, information resources, and popularization of websites – 20%.
- Training – 27%.

Let's name the forms of informational consulting used by education seekers:

- Training – 27%.
- Filling educational platforms, information resources, and popularization of websites – 33%.
- Receiving various assistance in the educational process – 36%.
- Research advisory services – 38%.

A significant number of education seekers and teachers do not effectively use ICT in educational activities because they are not sufficiently informed about the capabilities of the information and advisory environment, and are not ready to fully leverage it within their institutions. The ascertaining experiment showed that the vast majority of education seekers and teachers (on average, over 67%) did not demonstrate readiness at the required level to use the information and advisory environment: they lacked knowledge, skills, motivation, and abilities. During the experiment, it was revealed (Fig. 1):

- A low level of satisfaction among respondents with the capabilities of the environment was reported by 42% of respondents, according to the specified indicators.
- A sufficient level of satisfaction among respondents with the capabilities of the environment was reported by 44% of respondents, according to the specified indicators.
- A high level of satisfaction with the environment's capabilities was reported by 14% of respondents, according to the specified indicators.

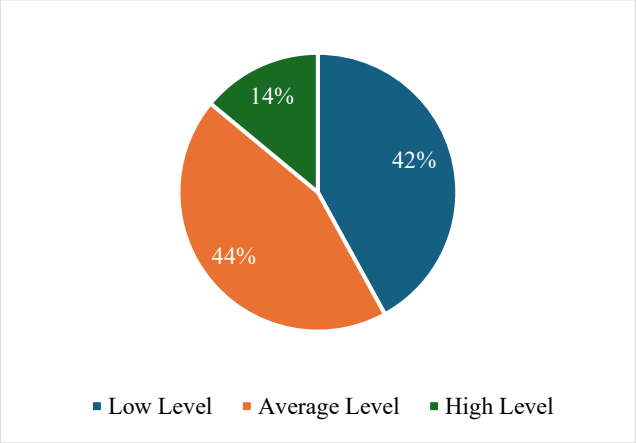

Fig. 1: Distribution of Respondents by Level of Satisfaction with the Environment's Capabilities.

Thus, the existing education system needs to be updated to leverage ICT in the educational process.

Therefore, we have developed a set of sufficient and necessary pedagogical conditions under which the selected components of an educational institution's information and advisory environment foster fruitful cooperation, operate in an interconnected manner, and contribute to the high-quality provision of educational services. These conditions include:

- Resource provision for the advisory activities of education seekers.
- To implement the functions of the information environment in the educational institution, the implementation of multidisciplinary and multi-channel online consulting is required.
- Readiness of teachers and education seekers to use modern ICT in consulting activities.
- To initiate methodological reflection among education seekers and teachers in consulting activities, through subject-subject creative and developmental interaction using ICT tools.

At the formative stage, the pedagogical conditions necessary for the effectiveness of organizing an information and advisory environment in an educational institution were tested, EG education seekers and teachers were trained to use the information and advisory environment of the educational institution, and innovative methods were proposed. The purpose of the experimental work in the formative stage was to verify the effectiveness of establishing an information and advisory environment within an educational institution.

At this stage, the following was carried out:

- Based on the results of the testing of pedagogical conditions, measurements were taken in the educational institution of the state on the use of the information and advisory environment.
- Comparison of the results of the control groups and experimental groups according to the previously determined methodology for processing the data obtained;
- Proving the effectiveness of the pedagogical conditions and formulating conclusions regarding the importance and necessity of organizing the information and advisory environment of the educational institution;
- Assessment of the effectiveness of the experiment, which is a tool for the dynamics of development in the educational institution of the information and advisory environment and innovative learning in the environment – in general, it is a complex procedure of a multifaceted nature as a means of consulting, using ICT.

In our study, we consider the information and advisory environment a system with the following properties: structurality, organization, emergence, integrity, development, reliability, and stability.

Seventy-eight students and 34 teachers participated in the study.

When forming the sample, we took into account the number and fullness of academic groups, specialties (including socionomic specialists), and the specialization of professional training.

Experimental groups (EG) and control groups (CG) were formed using the pairwise comparison method.
In institutions where experimental groups (EG) and control groups (CG) were formed during experiments, EG dynamics were tracked, indicating a positive level of organization in the information and advisory environment.

4.5. Analysis of the results of experimental work

Experimental work was carried out using the following methods: observations and interviews to identify the attitude towards the organization of the information and advisory environment of teachers and students of the educational institution; questionnaires to determine satisfaction with professional training and the feasibility of organizing an information and advisory environment in an educational institution; testing to identify the level of self-esteem and effectiveness of using the information and advisory environment in an educational institution in the process of forming a sample of the population; methods of mathematical statistics – Student's t-test and Pearson's χ^2-test for qualitative and quantitative analysis of empirical data.
Experimental work involved the formulation of two statistical hypotheses:
H_0: The dynamics of the levels of organization in educational institutions of the information and advisory environment are not more significant in the experimental groups than in the control groups.
H_1: The dynamics of the levels of organization in educational institutions of the information and advisory environment are more significant in the experimental groups than in the control groups.
In the case of $\chi^2_{emp} \geq \chi^2_{crit}$, the hypothesis H_1 was accepted, and the hypothesis H_0 was accepted in the case of – $\chi^2_{emp} < \chi^2_{crit}$.
The "Statistics" package was used to perform calculations. The empirical values of χ^2_{emp} obtained by Pearson's χ^2-criterion were compared with the values of χ^2_{crit} – critical tabular values, which correspond to the levels of statistical significance adopted in psychological and pedagogical research and which depend on the number of factors that are compared during the study. When assessing the dynamics of the organization of the information and advisory environment in an educational institution at four levels with a probability of error ρ of 0.05, 0.01, 0.001 units, χ^2_{crit} is – 7.82, 11.2, 16.26, respectively.
Therefore, we made conclusions about the effectiveness of the developed pedagogical conditions, methods of organizing an information and advisory environment in an educational institution: knowledge about the possibilities of an information and advisory environment; the degree of proficiency of respondents in ICT; the level of respondents who engage in self-education using ICT tools; satisfaction with the level of organization of the information and advisory environment in an institution; the level of use of the environment components, etc.
Let's analyze the results obtained.
A study of the indicators of readiness for interaction between teachers and students in an information and advisory environment, by all components, made it possible to obtain the following results:
According to the experimental results, the vast majority of students and teachers in the experimental group (60% on average) preferred an information- and advisory-oriented environment with high or sufficient readiness.
According to the experimental results, the social component of readiness was most developed (by 76% for teachers and 68% for students), followed by the subject component (64% for teachers and 60% for students). In the control group, there are also changes, but they are not significant.
Comparing data from the educational institution on the readiness of education seekers to interact in such an innovative environment with indicators of the organization of the information and advisory environment, the dynamics of these levels were clarified by the experimental results.
According to the experimental results, teachers and education seekers in the control group showed changes in their readiness to work in such an environment, but these changes were not statistically significant.
This dynamics is more pronounced among representatives of the experimental group (Fig. 2): 15% more teachers and education seekers who showed a high level of readiness for information and advisory interaction through the means of the environment became 21% more education seekers and 20% more teachers with an indicator of a sufficient level, due to a decrease of 32% of education seekers and 30% of teachers who showed a low level at the beginning of the experiment. 1% was the probability of error.

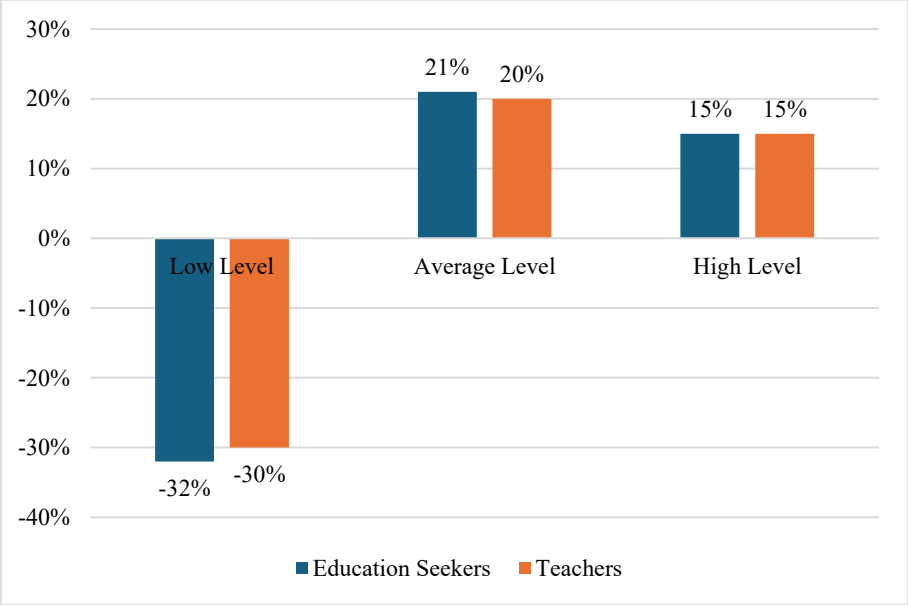

Fig. 2: Dynamics of Readiness Levels for Information and Advisory Interaction in the Experimental Group ($p \leq 0.01$).

Within the framework of the research and experimental work in the EG, education seekers and teachers had the opportunity to use ICT tools, identify the level of activity and readiness for use and learning in education, opportunities for receiving high-quality advisory support,

and build their own educational trajectory using various means of the information and advisory environment of the educational institution.
The next stage of the experimental work was to determine the level of satisfaction of teachers and education seekers with the capabilities of the environment, the organization of advisory activities, methods of presenting educational material, the functioning of the environment, forms of information organization, educational content, and the organization of the educational process, which included a self-assessment method.
Quantitative analysis of the data showed a statistically significant positive trend in satisfaction with information and advisory services at the educational institution. The number of respondents who were completely satisfied with the results of the experiment increased by 20% compared to the beginning of the experiment; those who were generally satisfied increased by 19%, and the number of respondents who were partially satisfied or dissatisfied decreased by 39%.

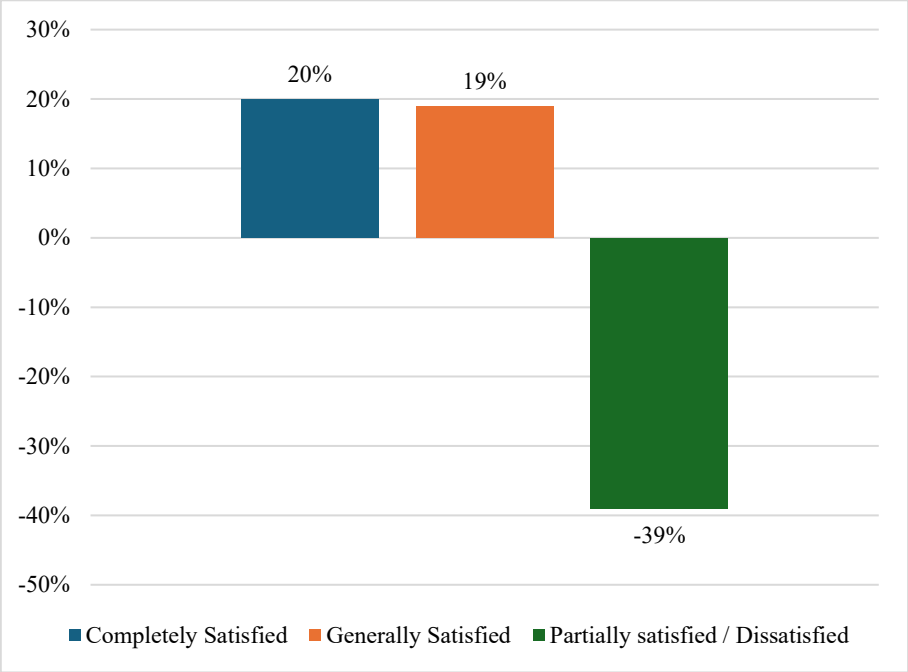

Fig. 3: Changes in Satisfaction with Information and Advisory Services at the Educational Institution ($p \leq 0.01$).

The results obtained were analyzed using the Student's t-test.
In the experimental group, at the formative stage, a larger, statistically significant increase was observed across all criteria for the components. In the control group, the advantage in terms of a sufficiently high level of organization of the information and advisory environment was not achieved.
Comparing the results of the formative and ascertaining stages of the experiment, we determined that the developed methodology, based on the author's pedagogical conditions for improving the quality of educational services and organizing the information and advisory environment, is effective in an educational institution.
We fully achieved the formative experiment's goal, as the developed methodology, supported by specific pedagogical conditions, ensured a high and sufficient level of organization of the information and advisory environment and realized the potential of this innovative environment within an educational institution.
Implementing the developed methodology for organizing the information and advisory environment of an educational institution, supported by specific pedagogical conditions that enhance its effectiveness, brings educational services to a new level and increases the awareness and culture of information among education seekers and teachers.

4.6. Statistical analysis of the results

To verify the effectiveness of the proposed methodology, inferential statistical analysis was conducted using Student's t-test for independent samples and Pearson's χ^2 test. The level of statistical significance was set at $p \leq 0.05$. All analyses were performed using the Statistics software package.
Comparison of experimental and control groups (post-test)
Student's t-test was applied to compare the post-test results of the experimental group (EG) and the control group (CG) across the defined criteria.

Table 1: Comparison of EG and CG Post-Test Results (Student's T-Test)

Criterion	Group	Mean (M)	SD	t	df	p-value
System organization	EG	3.82	0.41	4.36	110	< 0.001
	CG	3.21	0.47			
Readiness for interaction	EG	3.76	0.45	3.98	110	< 0.001
	CG	3.18	0.49			
Satisfaction with environment	EG	3.69	0.43	4.12	110	< 0.001
	CG	3.09	0.46			

The results indicate statistically significant differences between the experimental and control groups across all criteria, confirming the positive impact of the implemented pedagogical conditions.
Pre-test and post-test comparison within the experimental group
To assess changes within the experimental group, paired-samples t-tests were conducted.

Table 2: Dynamics Of Indicators in the Experimental Group (Pre-Test Vs Post-Test)

Criterion	Group	Mean (M)	SD	t	df	p-value
System organization	Pre-test	2.94	0.48	6.27	77	< 0.001
	Post-test	3.82	0.41			
Readiness for interaction	Pre-test	2.88	0.52	5.94	77	< 0.001
	Post-test	3.76	0.45			
Satisfaction with environment	Pre-test	2.79	0.50	6.11	77	< 0.001
	Post-test	3.69	0.43			

The observed increases across all indicators are statistically significant, demonstrating the effectiveness of the intervention.
Distribution of readiness levels (χ^2 test)
Pearson's χ^2 test was applied to examine differences in the distribution of readiness levels (low, sufficient, high) between groups.

Table 3: Distribution of Readiness Levels in EG and CG (χ^2 test)

Group	Low (%)	Sufficient (%)	High (%)	χ^2	df	p-value
EG	18	47	35	14.62	2	< 0.01
CG	41	39	20			

Table 3: Distribution of Readiness Levels in EG and CG (X^2 Test)

Group	Low (%)	Sufficient (%)	High (%)	χ^2	df	p-value
EG	18	47	35	14.62	2	< 0.01
CG	41	39	20			

The χ^2 test confirms statistically significant differences in readiness level distributions between the experimental and control groups.
Summary of statistical findings
The statistical analysis demonstrates that:

- All t-values exceed the critical threshold at $p \leq 0.05$.
- Degrees of freedom are consistently reported.
- The null hypothesis (H_0) was rejected in favor of the alternative hypothesis (H_1).

These results provide robust empirical evidence supporting the effectiveness of the proposed methodology for organizing an information and advisory environment in an educational institution.

5. Conclusion

The article substantiates the theoretical and organizational and technological principles of forming an information and advisory environment of an educational institution as a holistic system that ensures the improvement of the quality of educational services in the conditions of digital transformation. Its key components, functions and principles of organization are determined, and the significance of using modern digital and cloud technologies to expand the possibilities of educational and advisory interaction is proven.
The results of the ascertaining stage of the experiment showed an insufficient level of readiness of the majority of education seekers and teachers for the effective use of the information and advisory environment, which necessitated the development of a system of necessary and sufficient pedagogical conditions for its organization. The proposed methodology is aimed at increasing digital competence, motivation and activity of participants in the educational process, as well as ensuring the integration of advisory support into educational activities.
Experimental verification of the effectiveness of the developed methodology confirmed its effectiveness: in the experimental groups, a statistically significant increase in the indicators of readiness for information and advisory interaction and the level of satisfaction with the functioning of the environment was recorded compared to the control groups. The results obtained prove the feasibility of implementing the proposed approach in the practice of educational institutions and outline the prospects for further research in the direction of the development of innovative digital educational environments.

Further Implications

The results obtained have important theoretical and practical implications for the development of modern educational institutions. The proposed methodology for organizing an information and consulting environment can be used as a universal model for modernizing the educational process in the context of digitalization, in particular to improve the quality of consulting support, develop the digital and information culture of participants in the educational process, as well as optimize management and pedagogical decisions. The practical implementation of the identified pedagogical conditions contributes to the increase in the readiness of teachers and students to actively interact in the digital environment and the formation of individual educational trajectories.
In the scientific dimension, the results of the study create the basis for further interdisciplinary research aimed at integrating intelligent digital technologies, educational data analytics, and personalized consulting services into the structure of the information and consulting environment. It is also promising to study the long-term impact of such an environment on the professional development of teachers, the academic success of students, and the resilience of educational institutions to the challenges of digital transformation.

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