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Pedagogical focus of the use of information technologies in education: Kazakhstani experience

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Abstract. The integration of information technologies into education, in the broad sense, entails fostering the harmonious incorporation of children into the information society. This process requires the unification of educational (instructional) and developmental objectives. Information technologies today are no longer merely auxiliary pedagogical tools but have become an integral component of the school's teaching and educational process. However, in practice, computer tools and digital technologies are predominantly mastered by children outside of school and are mainly employed for gaming and entertainment purposes. Increasingly, their influence on the consciousness and behavior of children and adolescents is observed to be negative. The excessive interest of young people in digital technologies is not always effectively directed toward achieving educational and developmental goals. Therefore, orienting the use of information technologies toward the moral and personal development of schoolchildren is an urgent pedagogical challenge. This article focuses on exploring the ways to strengthen the educational orientation of information technology use within the pedagogical process of schools. It defines the essence and specific features of educationally oriented learning supported by information technologies and proposes a model for educational activities based on their application. Drawing on an analysis of best pedagogical practices in general education schools in Kazakhstan, the author identifies the pedagogical conditions necessary to ensure the effective integration of information technologies in fulfilling the educational objectives of instruction. The article also presents the author's methodology for enhancing the educational orientation of information technology use and reports the results of its practical implementation.

Keywords: education, information technologies (IT), pedagogical focus, school, children, teenagers.

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Introduction

Nowadays, technology has increasingly become an indispensable element in the list of core competencies required for the digital age (Ayyildiz et al., 2021; Mtebe & Raphael, 2018). In Kazakhstan, the current stage of social development is characterized by the pervasive integration of information technologies (IT) into all spheres of public life, facilitating information flows and shaping a unified information space. Education, as an essential part of the information society, is undergoing a process of informatization.

The informatization of education involves the modernization of content and pedagogical technologies to ensure the effective organization of the learning process with contemporary technical capabilities. It enables students to boost their motivation and enhance their knowledge and information efficiently (Chen et al., 2018). Its ultimate objective is to develop students' information and communication technology (ICT) competencies—often referred to as digital competencies—encompassing skills for interaction within communication systems, particularly those mediated by digital devices (Vásquez-Pajuelo, 2024). These competencies are essential for enabling a seamless and productive integration of graduates into the information society. Crucially, IT should serve not merely as an auxiliary teaching tool but as an integral component of the learning process, enhancing its overall effectiveness.

In this regard, Liu et al. (2022) emphasized that technology-integrated learning enhances students' cognitive understanding and academic performance. Furthermore, teaching and learning methods that incorporate ICT enable students to maintain communication with their instructors and peers through various social media platforms, assist them in addressing academic challenges, and foster their active engagement in the learning process (Liu et al., 2021).

For this study, information educational technologies are understood as "electronic means used in the implementation of educational activities, together with a set of methods ensuring their effective functioning" (Abubaeva, 2006). Warschauer (2002) distinguishes the effective use of ICT for accessing, adapting, and creating knowledge through four key categories of resources: (1) physical resources (e.g., computers, telecommunications), (2) digital resources (e.g., relevant content in multiple languages), (3) human resources (e.g., literacy and education), and (4) social resources (e.g., community and institutional support).

At present, the number of children and adolescents capable of operating computer-based tools has grown significantly; experts estimate a tenfold increase in the last five years. Their interest in digital technologies is notably high, which, to some extent, facilitates the informatization of school learning, particularly in systematically introducing the fundamentals of computer science. However, our research in schools in South Kazakhstan reveals that students primarily use computers for gaming and entertainment rather than educational purposes. Surveys conducted among primary school pupils indicate that learning-related motives rank low in their use of digital tools, thereby limiting the educational benefits of IT.

In current school practice, the informatization process is often oriented towards achieving instructional objectives while neglecting broader educational aims. Many teachers assume that integrating IT into the learning process inherently fulfills pedagogical functions, without consciously addressing the formation of values, attitudes, and behaviors. As a result, insufficient attention is paid to the educational potential of IT, particularly in fostering students' personal and moral development.

Moreover, the influence of digital content on children's psychology, consciousness, and behavior may lead to unintended consequences, such as increased juvenile delinquency, cyberbullying, ethical norm violations, and, in extreme cases, self-harm. Our observations

indicate that the pedagogical potential of IT remains underutilized, and current practices do not adequately guide its application towards the holistic development of students' personalities.

While IT offers broad opportunities to integrate moral, aesthetic, legal, environmental, labor, and economic values, as well as healthy lifestyle practices, into the educational process, its widespread use in schools is still primarily instructional rather than formative. Teachers of both informatics and other subjects generally possess strong technical skills, yet often overlook the educational dimensions of IT application.

The pedagogical use of IT in schools has attracted growing scholarly attention in recent decades, with research exploring its theoretical, scientific, and methodological aspects (Avezova et al., 2024; Akram et al., 2022; Bulanova-Toporkova, 2002; Sumardi et al., 2020). Of particular relevance to this study are works addressing the educational component of the learning process (Shchurkova, 2000; Kukushkin, 2002), as well as research on the pedagogical objectives of IT use (Almetov & Moldashova, 2014; Tevs et al., 2006; Selivanov, 2008; Korotenkov, 2005; Shanmugam &Balakrishnan, 2019; Solar et al., 2013).

Nevertheless, the pedagogical focus of IT integration in school learning remains insufficiently investigated. Several contradictions underscore this gap:

1) Between the practical demand for ensuring a pedagogical orientation in students' learning through IT and the lack of scientifically grounded recommendations for its implementation.

2) Between the IT-based organization of the school learning process and the low effectiveness in achieving educational goals related to personality development.

3) Between the need for a pedagogically oriented system of IT use in schools and the absence of such a system in current practice.

These contradictions emphasize the relevance of studying the pedagogical aspects of IT integration in the school learning process.

Basic provisions. The key idea of this study is to identify the ways to strengthen the educational orientation of information technology use within the pedagogical process of schools. This study highlights some basic provisions:

1) Integration of Information Technologies in Education – The use of IT in education should integrate educational and developmental objectives, thereby ensuring the harmonious incorporation of children into the information society.

2) Changing Role of IT – Information technologies have evolved from auxiliary learning tools into an integral component of the school educational process, influencing both learning and upbringing.

3) Use of IT Outside the Classroom – Most children acquire IT skills outside of school, primarily for gaming and entertainment purposes, which may exert a negati ve influence on their consciousness and behaviour.

4) Need for Pedagogically-Oriented Use of IT – The excessive interest of children and adolescents in digital technologies necessitates targeted pedagogical guidance to ensure their use for educational and developmental purposes.

5) Pedagogical Significance – Directing IT applications toward students' moral, social, and personal development constitutes an urgent educational task for contemporary schools.

6) Proposed Model – The article presents a model of learning activities based on the use of information technologies aimed at strengthening the developmental and moral-educational components of school education.

7) Pedagogical Conditions for Effectiveness – Based on an analysis of advanced pedagogical practices in Kazakhstani schools, the study identifies the conditions necessary for the effective integration of information technologies to achieve learning and developmental objectives.

8) Methodological Contribution – The author developed a methodology for enhancing the developmental orientation of IT use in schools, substantiated by the results of its practical implementation and experimental testing.

Methods

The study employed a combination of theoretical and empirical research methods. The theoretical component included an analysis of philosophical, pedagogical, psychological, scientific, methodological, and specialized literature on the research problem, as well as systematic and comparative analysis and synthesis of relevant materials. Empirical methods comprised pedagogical observation, questionnaires, rating and self-assessment techniques, expert evaluation, self-analysis, and a pedagogical experiment. Both quantitative and qualitative methods were applied to analyze the experimental results.

Informatization of education is currently one of the leading trends in educational development. The integration of computer technologies is expected to accelerate modernization processes and enhance the quality of forming the core competencies of secondary school graduates. However, despite the widespread introduction of IT into schools, several organizational and pedagogical challenges remain, requiring comprehensive solutions to ensure the successful informatization of the educational process.

The key objectives of school education informatization include:

- creating a unified school information space for all users;
- developing techniques, technologies, and practice-oriented principles for ICT integration into the learning process to improve educational quality;
- planning and implementing measures for the creation and dissemination of educational and pedagogical resources;
- producing electronic versions of academic, pedagogical, and instructional materials, as well as audiovisual programs, and establishing school websites;
- developing teachers' information and communication competencies, and enhancing their readiness to conduct educational and pedagogical work using IT;
- channeling students' growing interest in computer technologies towards constructive educational purposes (Tevs et al., 2006).

The literature review identifies the following main purposes of integrating computer technologies into the school learning process:

1) fostering students' skills in information management;
2) developing the competencies required for graduates to adapt successfully to the modern information society;
3) designing and delivering educational and pedagogical content accessible to students;
4) enhancing cognitive potential, research skills, and independent problem-solving abilities (Selivanov, 2008; Korotenkov, 2005).

The use of ICT in educational activities can significantly transform the methods and organizational forms employed by teachers, opening new opportunities to influence students' thinking, behavior, and talent development. Computer technologies also improve the efficiency of planning, organizing, monitoring, and evaluating the learning process at both the whole-school and individual class levels. Information and resource management thus become integral components of modern pedagogical practice.

Moreover, ICT supports the organizational, motivational, and evaluative functions of education. A well-structured informational and educational environment with a clear pedagogical orientation address many of the pressing challenges in children's and adolescents' education. It also serves as a "pedagogical safeguard" against some of the negative consequences of societal informatization—such as juvenile delinquency, self-harm, and antisocial behavior—

by directing students' engagement with digital tools towards constructive and value-based learning experiences.

The pedagogical process involving ICT contributes to:

1. enhancing the attractiveness and engagement value of pedagogical materials for students;
2. fostering socially significant qualities in children through interaction with digital technologies;
3. developing students' creative abilities and information culture;
4. cultivating intercultural communication skills;
5. saving time in the planning, organization, and monitoring of pedagogical activities;
6. enriching the informational content and clarity of instructional processes;
7. providing instant feedback during pedagogical interaction;
8. channeling students' interest in digital tools towards their education and personal development.

The use of computer technologies offers considerable potential for both students and teachers. For students, ICT serves as a tool for self-development and self-education, as an additional motivator for various activities, as a means of visualizing learning content, and as a platform for acquiring experience in information use across educational, communicative, and real-life contexts. For teachers, it expands the range of pedagogical forms, methods, and techniques available for influencing and engaging learners.

We identify the following key directions for integrating ICT into pedagogical work:

- optimizing the quality and efficiency of the pedagogical process;
- acquiring and mastering pedagogical experience and creating educational products;
- exploring new opportunities for pedagogical development and forecasting future trends;
- organizing student activities and communication, fostering self-directed learning;
- structuring students' leisure time in a pedagogically meaningful way;
- supporting the management of pedagogical activities at the school level.

In mainstream school practice, ICT is most often applied to prepare illustrative pedagogical materials or presentations for students and their parents. However, its use should extend beyond simple presentation functions to encompass the full potential of information and communication tools in achieving diverse educational objectives. Leading educators create a unified school information-educational environment that actively involves students in school life and stimulates multiple forms of activity—academic, creative, social, artistic, aesthetic, and physical—thereby promoting comprehensive development. The integration of ICT must therefore be elevated to a qualitatively higher level in both the organization and effectiveness of the pedagogical process.

From a pedagogical standpoint, the use of IT in schools can be categorized into the following functions: 1) information search; 2) information processing; 3) keeping information about the pedagogical work at school, 4) implementing the principle of visualization in the pedagogical process, and 5) interpersonal and intercultural communication.

When using computers for the purposes of information processing, information technologies are used for collecting and processing data on the schoolchildren's progress, attendance, and education; for monitoring and evaluation of the learning process, and for their visual images in the form of tables, charts, and graphs. In addition, computer databases on schoolchildren of a class and school are created, schoolchildren's achievements are accounted for and analyzed, schoolchildren's opinions are studied on various issues of the survey, testing for the study of different aspects of the schoolchild's personality development, and making changes and additions to the content of pedagogical work are analyzed.

ICT also facilitates adjustments and improvements to pedagogical content based on systematic feedback and performance analysis. However, school administrators and teachers increasingly

report that the volume of administrative documentation—business reports, pedagogical plans, portfolios, and other records—continues to grow despite attempts to optimize it. In many cases, school storage spaces are filled with documents required to be kept for one to three years.

The use of computer tools as a means of storing and managing information on pedagogical activities offers substantial advantages for teachers, saving both time and effort. The development of dedicated databases for pedagogical work, along with photo and video archives—such as digital albums documenting educational events, electronic collections of instructional materials at the school and class levels, and video repositories—significantly streamlines record-keeping and reporting for both internal and external audits.

Information technologies also contribute to creating an aesthetically rich and emotionally engaging pedagogical environment. Digital presentations, illustrative materials, rapid exhibitions of ongoing pedagogical activities, school e-magazines, virtual modeling of instructional situations, and the design of games, quizzes, and theatrical performances with ICT tools enhance the emotional impact of the educational process. Computer-generated educational scenarios help cultivate students' understanding of behavioral norms, moral principles, and worldview, reinforcing value-based education.

Students are not merely passive observers of visually appealing pedagogical content. When their interest in digital tools is purposefully directed toward the creation of "informational and pedagogical products," such as graphics modeling prosocial behaviors, humanistic ideals, and national and universal values, it fosters the alignment of personal and public interests. Such engagement builds a form of "informational immunity" against harmful digital influences that may promote violence, self-harm, or other socially undesirable behaviors, instead nurturing ideals of kindness, peace, and civic responsibility.

ICT also serves as an effective medium for communication within the pedagogical process. Online conferences, videoconferences, and intercultural dialogues expand students' opportunities for cross-cultural interaction. Virtual round tables on topics of relevance to children and adolescents can be organized, and carefully curated electronic correspondence between students and their peers can support personal growth and the development of social skills.

Analysis of best pedagogical practices has enabled us to identify the following forms of ICT application in school-based pedagogical work:

- searching for and analyzing information relevant to pedagogical activities;
- creating a school-wide database of pedagogical work across different domains;
- conducting comprehensive diagnostic testing, monitoring, and assessment of student learning;
- developing school-based mass media platforms;
- preparing and conducting virtual round tables and conferences;
- providing information for student and parent meetings;
- simulating pedagogical situations in virtual formats;
- compiling student portfolios;
- maintaining student data records (health, academic achievements, attendance);
- designing educational computer games and entertainment activities;
- establishing school computer clubs, game rooms, and multimedia studios;
- supporting students' self-development and self-evaluation plans;
- implementing student-led and innovative projects in various domains;
- keeping digital records for classroom teachers;
- creating media libraries of open pedagogical activities and instructional materials;
- delivering online lessons and consultations by innovative educators.

Overall, ICT facilitates the optimization of the pedagogical process, actively engages students as participants in their educational environment, and promotes creativity, autonomy, and the internalization of socially valuable norms of behavior and activity.

Computer technologies enable the creation of diverse pedagogical situations that evoke specific emotional responses in students. Concise, precise, and visually engaging instructional materials quickly capture students' attention, elicit positive emotions, stimulate imagination, foster morally sound decision-making, and cultivate socially significant norms and behavioral habits. A skillful pedagogical integration of students' interest in digital technologies with morally valuable and emotionally resonant content contributes to the formation of value-oriented thinking.

According to several scholars, the key criteria for the effective use of computer technologies include: time efficiency for both teachers and students; the clarity and visibility of electronic pedagogical materials; the capacity to monitor the dynamics of the pedagogical process; compactness in storing large volumes of information; and the potential for fostering students' creative and personal development (Bulanova-Toporkova, 2002).

Researchers also emphasize that, within the pedagogical process, the role and place of information resources should be clearly defined within the broader system of teacher–student interactions. Importantly, the integration of ICT into curricular and extracurricular activities does not diminish the significance of other pedagogical tools and resources; rather, it enhances and interacts synergistically with them. In this regard, ICT serves as an effective means of achieving the aims and objectives of student education.

Results and Discussion

Based on our analysis, the following pedagogical conditions are essential for ensuring the effective use of ICT in school-based educational work:

- Coordinated action between teachers and school administrators in applying ICT for pedagogical purposes.
- Logistically efficient and pedagogically grounded integration of ICT.
- Creation of an information-rich, educational, and developmental school environment.
- Stimulation and encouragement of creativity among both teachers and students in the use of ICT.
- Integration of students' interest in digital technologies with the development of their moral and emotional domains.
- Application of ICT across the full range of student activities—academic, recreational, civic, artistic, aesthetic, and physical—thereby enriching the pedagogical content of each.
- Orientation of ICT use toward the personal development of every student.
- Alignment of ICT-based pedagogical activities with other educational strategies and mechanisms.

We have developed a conceptual model of ICT-supported pedagogical activities (Figure 1). This model illustrates how ICT optimizes educational work, facilitates the creation of a rich informational and developmental environment, strengthens students' active engagement in the learning process, and accelerates the production and dissemination of pedagogical and methodological materials. Virtual pedagogical scenarios have a positive influence on students' cognitive and behavioral development, shaping socially valuable habits and personal qualities. Furthermore, computer technologies contribute to the professional growth of teachers, expanding both the scope and the geographical reach of professional communication. Consequently, the school evolves into a pedagogical system equipped with advanced informational, methodological, and resource capacities.

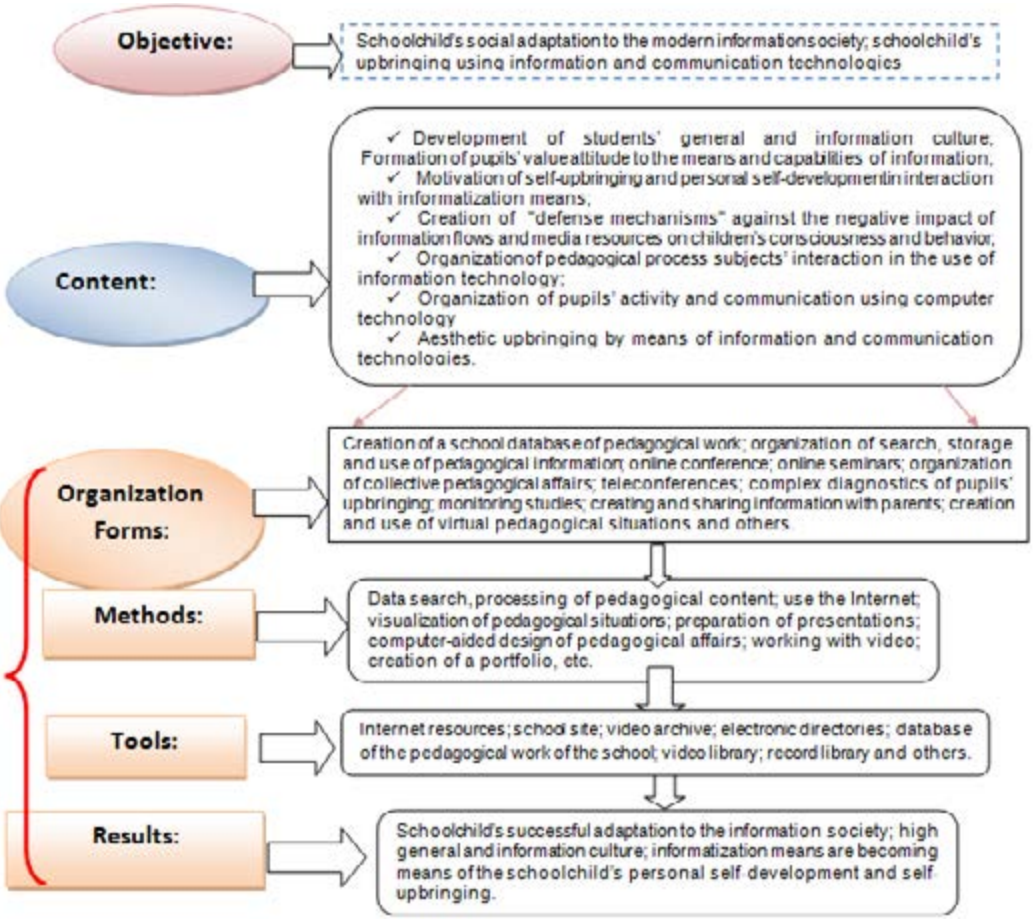

Figure 1. Model of pedagogical activities using information technologies

The study identified a set of objectives that can be effectively addressed in organizing pupils' education through the integration of IT:

1) Development of computer-based models of the school's pedagogical system, as well as strategic and annual plans for pedagogical work at all levels of the institutional framework.

2) Effective organization, planning, implementation, monitoring, and evaluation of pedagogical activities at both the school and classroom levels through the use of IT, digital learning resources, and communication systems.

3) Analysis of existing conditions and the design of innovative forms, methods, and tools for organizing teachers' pedagogical activities.

4) Design and implementation of pedagogical interactions within the systems "teacher–pupil," "pedagogical environment–pupil," and "teacher–class."

5) Preparation of methodological systems and educational technologies based on IT, aimed at fostering pupils' intellectual, ideological, spiritual–moral, emotional, and volitional development.

6) Application of monitoring and evaluation tools to assess the processes and outcomes of pedagogical work within the school's information-rich educational environment.

7) Enhancement of teachers' professional competence in organizing pedagogical work through the use of digital resources.

The informatization of pedagogical work entails the application of information systems—built on microprocessor technologies and digital products—to achieve specific educational

goals and objectives. Within the broader context of planning and organizing the pedagogical process, several priority areas emerge:

1) Fostering in pupils a value-based attitude toward the tools and potential of informatization.

2) Encouraging and motivating the development of pupils' information culture.

3) Protecting children from the adverse effects of harmful information flows on their consciousness and behavior.

4) Facilitating interaction among all participants in the pedagogical process within the school's digital environment.

5) Organizing and modernizing the pedagogical systems of the school and classroom through the integration of computer technologies.

6) Creating digital products that support the achievement of pedagogical aims and objectives.

7) Organizing pupils' learning and communication through the development of online education systems.

The integration of ICT into pedagogical work with schoolchildren offers multiple advantages:

- A more flexible and responsive school pedagogical system, capable of adapting to changes and innovations.
- Accelerated processes for searching, processing, and applying pedagogical information.
- Transformation of the school's information–educational environment into a space that is not only instructional but also purposefully implements pedagogical objectives.
- Improved time management in designing, organizing, monitoring, and analyzing the results of pedagogical activities.
- Expanded opportunities for the use of audiovisual materials and video content to support pedagogical scenarios.
- Broadened scope of interaction between teachers and pupils.
- Increased opportunities for the exchange of innovative practices and exemplary pedagogical methods.
- Alignment of children's interest in computer technologies with meaningful pedagogical content.
- Enhanced attractiveness of pedagogical work through the integration of information resources.
- Accelerated adaptation of pupils to the modern information environment, enabling them to acquire not only academic knowledge and skills but also broad social, communicative, and creative competencies.
- Improved organization and overall effectiveness of the pedagogical process.

This study evaluated the effectiveness of the identified pedagogical conditions and, on this basis, developed techniques to enhance the pedagogical focus of using IT in the learning process through a pedagogical experiment.

The experiment was conducted in two stages. At the diagnostic stage, the initial state of schoolchildren's learning in the context of IT use was assessed. The evaluation of its effectiveness was based on the following criteria:

1) Students' value-oriented attitudes toward the means and potential of IT;

2) Students' motivation to develop an information culture;

3) Formation of "defense mechanisms" against the negative influence of information flows and media resources on students' consciousness and behavior;

4) Development of mental work skills through the use of educational information technology;

5) Aesthetic education of students through the means of IT.

These criteria were operationalized through corresponding indicators (Table 1).

Table 1. Criteria and indicators for assessing the pedagogical focus of learning with the use of information technologies

Criteria	Indicators
Schoolchildren's value-based attitude toward the means and potential of (IT)	• Ability to evaluate the role of information in contemporary society; • Understanding of the essence and key characteristics of IT; • General knowledge of tools and resources of informatization; • Awareness of the role of IT in education; • Ability to effectively utilize information resources in daily life and educational activities.
Schoolchildren's motivation for developing an information culture	• Willingness to engage with information sources in the school environment; • Positive attitude toward the means and potential of information technologies; • Interest in acquiring proficiency in IT and aspiration toward mastery; • Capacity for independent work with information technology.
Formation of "defense mechanisms" against the negative impact of information flows and media resources on pupils' consciousness and behavior	• Application of information technology for self-education and self-development; • Ability to identify and critically evaluate the negative aspects of information flows and media resources; • Development of conceptual frameworks to counteract harmful media influences; • Demonstration of behavioral "defense mechanisms" against adverse effects of media and information flows.
Development of cognitive work skills through educational information technology	• Proficiency in operating computer equipment; • Knowledge of computer technologies and their applications; • Ability to integrate computer technologies into learning processes.
Aesthetic education of pupils through information technology	• Appreciation for beauty as mediated through information technology; • Acquisition of aesthetic values through IT; • Ability to create aesthetically appealing outputs using information resources.

Based on the above criteria, four possible levels of schoolchildren's education in the use of information technology (IT) have been identified:

Level I – High. Students demonstrate a strong value-based attitude toward IT tools and their potential. They show high motivation and sustained interest in mastering information culture. Stable "defense mechanisms" are formed to counteract the negative influence of information flows and media resources on their consciousness and behavior. They possess well-developed skills in intellectual work using information resources, including search, summarization, analysis, processing, and compilation of data. They also display a consistent aesthetic attitude toward academic work involving digital technologies.

Level II – Sufficient. Students generally regard IT tools and their potential as valuable, showing adequate motivation and interest in acquiring information culture. "Defense mechanisms" against the harmful effects of information flows and media resources are present. Skills in mental work with information resources are often demonstrated, and in most cases, they exhibit an aesthetic approach to academic work involving IT.

Level III – Medium. Although students recognize IT tools as valuable, this perception is inconsistent. Motivation and interest in mastering information culture are observed only occasionally. "Defense mechanisms" against negative informational influences appear sporadically. Skills in using information resources for mental work are only partially developed, and the aesthetic attitude toward IT-based academic work is weak.

Level IV – Low. Students do not perceive informatization as a value. They show no motivation or interest in mastering information culture and are highly susceptible to the negative effects of information flows and media resources. Skills in mental work using IT are absent, and there is no evidence of an aesthetic approach to IT-based academic work.

A set of scientifically grounded pedagogical methods is applied to examine the pedagogical orientation of learning through information technologies (Table 2).

Table 2. Methods for Examining the Pedagogical Focus of Learning through the Use of Information Technology

Criteria	Methods
1) Schoolchildren's value-based attitudes toward the means and potential of IT	Survey, interview
2) Schoolchildren's motivation for developing an information culture	Expert assessment, rating method, self-assessment method
3) Formation of "defense mechanisms" against the negative influence of information flows and media resources on pupils' consciousness and behavior	Pedagogical observation, interview, and independent characteristics method
4) Development of mental work skills through the use of educational and information technology tools	Examination, interview, questioning
5) Pupils' aesthetic education through informatization tools	Pedagogical observation, examination

The pedagogical experiment was conducted among 5th–7th grade pupils (early adolescence) in schools located in Shymkent city and rural areas of the South Kazakhstan Province. The study involved 243 pupils and 33 teachers.

The experiment comprised two stages.

Verification stage: The initial state of the pedagogical orientation of IT use was assessed. Using a random sampling method, control and experimental groups were identified. Diagnostic methods were employed to determine pupils' levels of educational development through IT. The quantitative results of the verification stage are presented in Table 3.

Table 3. Levels of Pupils' Educational Development through IT-based Learning (Verification Stage)

Groups	Levels			
	High	Sufficient	Medium	Low
Control group (CG)	-	17,3%	47,3%	47,4%
Experimental group (EG)	-	16,6 %	44,4%	45 %

The distribution of pupils' educational development levels at the verification stage is illustrated in Figure 2.

Analysis of the verification stage results indicates the following:

a) Schoolchildren's interest and willingness to master IT are primarily driven by their engagement with computers outside of school. However, the pedagogical orientation of IT mastery toward enhancing intellectual abilities, fostering socially valuable behavior, and stimulating constructive activity remains insufficient.

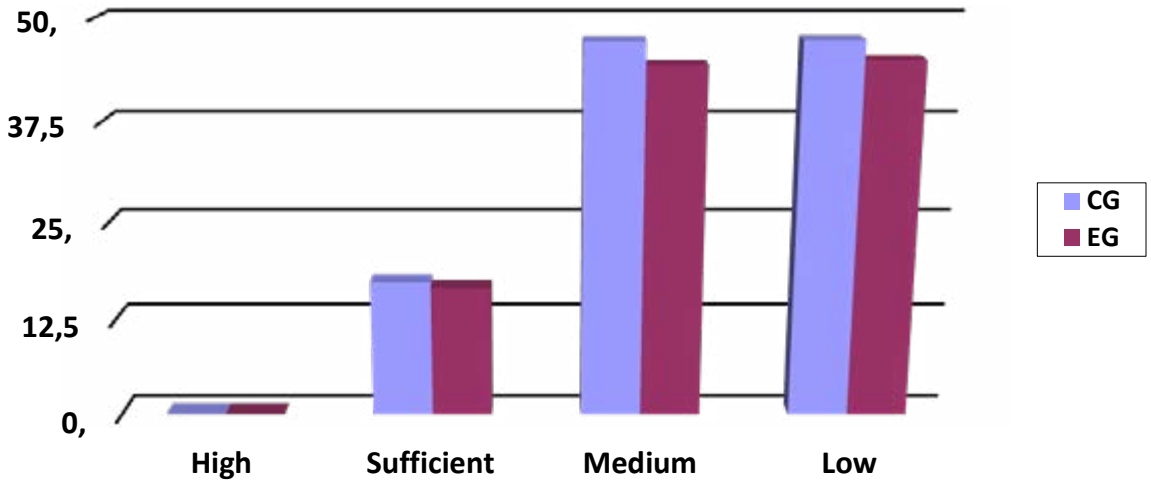

Figure 2. Levels of Pupils' Educational Development through IT-Based Learning (Verification Stage)

b) "Defense mechanisms" protecting schoolchildren from the negative influence of information flows and media resources on their consciousness and behavior are largely absent.

c) Pupils' interest and willingness to master IT are generally at the medium and sufficient levels. While they demonstrate interest in working with information tools, their motivation to cultivate a full-fledged information culture remains insufficient.

d) In both the experimental and control groups at the beginning of the study, the overall level of pupils' educational development through IT was low. In our view, this can be attributed to the following factors:

- Weak representation of the pedagogical focus in IT-based learning;
- Absence of a functional approach to teaching computer science in schools;
- Lack of emphasis on fostering value-oriented attitudes toward IT among pupils;

- Insufficient attention from teachers to motivating pupils toward developing an information culture;

- Poorly organized, purposeful communication among participants in the pedagogical process within a unified school information environment;

- Limited preparation and pedagogical application of information products in achieving educational objectives;

- Insufficient focus on organizing pupils' activities and communication through the active development of online education systems.

Consequently, the current practice of IT-based learning in schools does not provide an adequately effective pedagogical focus.

Formative Stage of the Pedagogical Experiment: During the formative stage, a specially designed methodology for educating early-adolescent pupils through IT-integrated learning was implemented in the experimental groups. In the control groups, IT-based pedagogical objectives in classroom activities were pursued using conventional teaching methods.

The methodology applied in the experimental groups comprised the following organizational and methodological measures:

1) Fostering pupils' value-oriented attitudes toward the means and potential of educational informatization;

2) Stimulating and motivating the development of pupils' information culture;

3) Harnessing the positive potential of information flows and media resources while fostering defense mechanisms against their negative influences;

4) Organizing purposeful interaction among participants in the pedagogical process when using IT in learning;

5) Structuring, managing, and modernizing the pedagogical work of the school through the use of information resources;

6) Developing and applying educational information products both in the classroom and in extracurricular pedagogical activities;

7) Facilitating pupil engagement and communication through the active development of online education systems.

These measures were implemented during computer science lessons, subject lessons in the natural sciences, and elective and extracurricular club activities, thereby reinforcing the pedagogical orientation of IT use in the learning process.

Table 4 presents comparative data from the verification and formative stages of the pedagogical experiment, aimed at assessing the effectiveness of the proposed pedagogical conditions and the technique for enhancing the pedagogical orientation of IT integration in the learning process.

The results of the formative stage indicate a substantial improvement in the level of educational attainment among pupils in the experimental groups compared with those in the control groups. Specifically, by the end of the experiment, the proportion of pupils achieving a high level of education based on IT use in learning was 24.7% in the experimental groups, compared with only 2.1% in the control groups.

Similarly, the proportion of pupils attaining a sufficient level of educational achievement in the experimental groups increased to 39.6%, while in the control groups this figure was only 18.3%.

In contrast, the proportion of pupils with medium and low levels of educational attainment was markedly lower in the experimental groups (27.4% and 8.3%, respectively) compared with the control groups (48.3% and 31.3%, respectively).

Table 4. Comparative data on the levels of pupils' educational attainment in the learning process based on IT

Groups Levels	Control group		Experimental group	
High	–	2,1%	–	24,7%
Sufficient	17,3%	18,3%	16,6 %	39,6%
Medium	47,3%	48,3%	42,8%	27,4%
Low	35,4%	31,3%	45 %	8,3%

These findings demonstrate clear quantitative and qualitative improvements in the educational attainment of pupils in the experimental groups, confirming the pedagogical effectiveness of IT integration in the learning process (Figure 3).

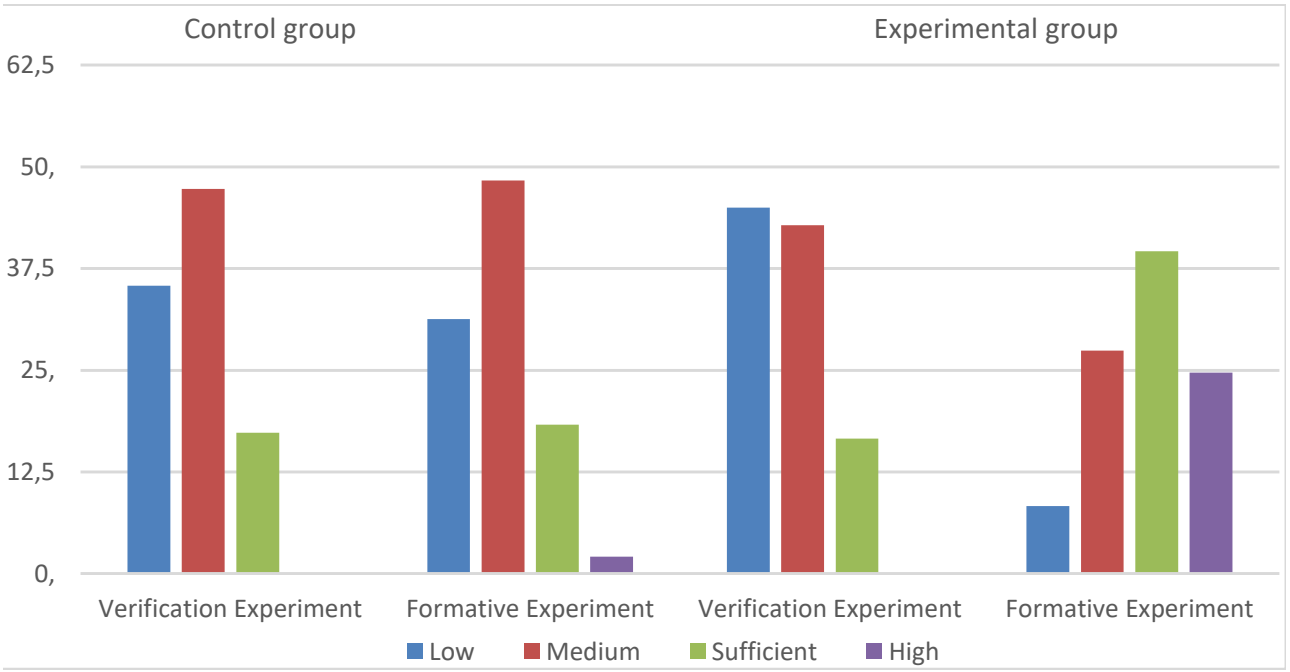

Figure 3. Comparative data on the level of pupils' learning in the learning process based on IT

Conclusion

Overall, the results of the pedagogical experiment demonstrated the effectiveness of the identified pedagogical conditions and the techniques developed on their basis for educating early-adolescent schoolchildren through the use of IT in the learning process.

The approach formulated in this study fostered students' value-oriented attitudes toward IT as a tool for personal development and enhanced their pedagogical engagement. It also contributed to the development of individual "defense mechanisms" against the negative influence of information flows from the Internet that affect children's consciousness and behavior. A general improvement in students' information culture was observed.

Furthermore, computer technologies became an effective means of organizing teachers'

pedagogical activities and facilitating students' self-directed learning. Information technology was thus elevated to the status of a key procedural component within the pedagogical system of secondary school education.

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Conflict of interest

The authors confirm that there are no potential or actual conflicts of interest related to this study.

Contribution of the authors:

Almetov N.S. – was responsible for the concept of the research work.

Zhorabekova A.N. – was responsible for coverage and systematization on the chosen topic.

Yessimgaliyeva T.M. - developed a detailed plan for data collection and selection of analysis methods.

Abilkhairova Z.A. – organized and conducted the main experiment as part of the study, and was responsible for data collection and processing.

Yerekhanova F.T. – described the research methods, a significant contribution to the concept or design of work; collection, analysis and interpretation of the results of the work.

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Білім беруде ақпараттық технологияларды пайдаланудың педагогикалық бағыты: Қазақстан тәжірибесі

Аңдатпа. Білім берудегі ақпараттық технологиялардың интеграциясы кең мағынада балаларды ақпараттық қоғамға үйлесімді енгізуге ықпал етуді көздейді. Бұл процесс білім беру (тәрбие) және дамыту мақсаттарын біріктіруді талап етеді. Ақпараттық технологиялар бүгінде тек көмекші педагогикалық құралдар ғана емес, мектептің оқу-тәрбие процесінің ажырамас

бөлігіне айналды. Алайда, іс жүзінде компьютерлік құралдар мен цифрлық технологияларды негізінен мектептен тыс балалар игереді және негізінен ойын-сауық және ойын-сауық мақсатында қолданылады. Олардың балалар мен жасөспірімдердің санасы мен мінез-құлқына теріс әсері барған сайын байқалады. Жастардың цифрлық технологияларға деген шамадан тыс қызығушылығы әрқашан білім беру және дамыту мақсаттарына қол жеткізуге тиімді бағыттала бермейді. Сондықтан ақпараттық технологияларды оқушылардың адамгершілік және тұлғалық дамуына бағдарлау өзекті педагогикалық міндет болып табылады. Бұл мақаланың мақсаты – мектептің педагогикалық процесінде ақпараттық технологияларды қолданудың білім беру бағытын күшейту жолдары қарастыру. Ақпараттық технологияларды қолдана отырып, білім беруге бағытталған оқытудың мәні мен ерекшеліктері анықталды және олардың негізінде білім беру қызметінің моделі ұсынылды. Қазақстанның жалпы білім беретін мектептерінің озық педагогикалық тәжірибесін талдау негізінде автор педагогикалық жағдайларды анықтайды. Қазақстанның жалпы білім беретін мектептерінің озық педагогикалық тәжірибесін талдау негізінде автор оқытудың білім беру мақсаттарын іске асыруға ақпараттық технологиялардың тиімді интеграциялануын қамтамасыз ету үшін қажетті педагогикалық жағдайларды анықтайды. Мақалада ақпараттық технологияларды қолданудың білім беру бағытын арттырудың авторлық әдістемесі ұсынылған және оны практикалық қолдану нәтижелері келтірілген.

Түйін сөздер: білім беру, ақпараттық технологиялар (АТ), педагогикалық бағыт, мектеп, балалар, жасөспірімдер.

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Педагогическая направленность использования информационных технологий в образовании: опыт Казахстана

Аннотация. Интеграция информационных технологий в образование в широком смысле предполагает содействие гармоничному включению детей в информационное общество. Этот процесс требует объединения образовательных (воспитательных) и развивающих целей. Информационные технологии сегодня уже не просто вспомогательные педагогические средства, а стали неотъемлемой частью учебно-воспитательного процесса школы. Однако на практике компьютерные средства и цифровые технологии преимущественно осваиваются детьми вне школы и применяются в игровых и развлекательных целях. Всё чаще наблюдается их негативное влияние на сознание и поведение детей и подростков. Чрезмерный интерес молодёжи к цифровым технологиям не всегда эффективно направлен на достижение образовательных и развивающих целей. Поэтому ориентация использования информационных технологий на нравственное и личностное развитие школьников является актуальной педагогической задачей. Целью данной статьи является рассмотрение путей усиления образовательной направленности использования информационных технологий в педагогическом процессе школы. Определены сущность и особенности образовательно-ориентированного обучения с использованием

информационных технологий и предложена модель образовательной деятельности на их основе. Анализ передового педагогического опыта общеобразовательных школ Казахстана позволил выявить педагогические условия, необходимые для обеспечения эффективной интеграции информационных технологий в реализацию образовательных целей обучения. В статье также представлена авторская методика повышения образовательной направленности использования информационных технологий и представлены результаты её практического применения.

Ключевые слова: образование, информационные технологии (ИТ), педагогическая направленность, школа, дети, подростки.

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