

Article

# Attitude to Distance Learning of Schoolchildren and Students: Subjective Assessments of Advantages and Disadvantages

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**Abstract:** Currently, during the pandemic, the forced transition to distance learning carries a number of problems. These problems affect various aspects of education, including the study of students' attitudes to distance learning. The purpose of this research is to study the features of the subjective attitude of schoolchildren and students to distance learning. This research involved 140 secondary school students (average age  $M = 10.7$ ,  $SD = 7.2$  (66.3% men)) and 30 university students (average age  $M = 22.5$ ,  $SD = 2.4$  (20% men)). The methods used were a questionnaire, Chi-square test and Criterion  $\varphi^*$ . Fisher angular transformation. The study showed that schoolchildren do not intend to continue studying in the distance form if they choose, with a generally positive attitude towards distance learning. The self-assessment of motivation to study in a distance format has not changed, both among schoolchildren and students. Students are more likely to have a positive attitude to distance learning than schoolchildren. The variety of choices of advantages and disadvantages of distance learning is greater among students than among schoolchildren. The perspective of this study is thus to study the factors that determine the positive and negative attitudes to distance learning.

**Keywords:** distance learning; schoolchildren; students; attitude to distance learning



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## 1. Introduction

Currently, global changes are taking place, largely as a result of the pandemic. This applies not only to the political, economic and social spheres of our life but also to the educational process in particular. The transition to online training has become a necessity, though distance learning, which has a close connection with rapidly developing computer technologies, has opened up promising prospects. However, the associated research and analysis of the literature show that there are certain contradictions in the very essence of the concept, as well as a number of shortcomings related to technology, teaching methods and the relationship between students and teachers.

Due to the sudden spread of coronavirus (COVID-19) and the consequent threat to people's lives, states were forced to adopt a system of measures aimed at preserving public health, in accordance with the recommendations of the World Health Organization [1]. In Russia, schools and universities have accordingly switched to distance learning. The emergency transfer of training to a distance format under the conditions of a pandemic had significant differences from properly planned e-learning because it assumed the forced closure of universities and schools and a bar on students and teachers visiting them. It also involved the mandatory restriction of all citizens to their homes, with the possibility of visiting only a limited number of shops and pharmacies located nearby, as well as the observance of social distancing measures [1].

According to the Federal Law on Education in Russia, "electronic learning", which consequently came into play, refers to the organization of educational activities with the use of the information contained in databases and used in the implementation of educational programs. This necessitated the use of information technologies, as well as information

and telecommunication networks enabling the transmission of this information through communication lines: namely, the interaction of students and teaching staff.

Thus distance educational technologies are understood as being implemented mainly through information and telecommunication networks and involving the indirect (i.e., distance) interaction of students and teaching staff [2].

## 2. Literature Review

The history of distance learning includes a wide variety of educational environments, forms and methods of knowledge transfer and mastering, and many definitions have been proposed in the modern literature. Greenberg [3] defines modern distance learning as a “planned teaching/learning experience that uses a wide spectrum of technologies to reach learners at a distance and is designed to encourage learner-interaction and certification of learning” (p. 36). Tister and Blizner [4] stated that the term “has been applied to many instructional methods: however, its primary distinction is that the teacher and the learner are separate in space and possibly time” (p. 741).

Keegan [5] provided the most complete definition, underlining that distance education and training are the results of the technological separation of teacher and student, which relieves the student of the need to travel to “a fixed place, at a fixed time, to meet a fixed person, in order to be trained”. According to [6], distance learning is a process of interactive communication between teacher and student. Andreev and Soldatkin [7] provided the following definition: “distance-learning is a purposeful process of interactive interaction of teachers and students with each other and with learning tools, invariant (indifferent) to their location in space and time, which is implemented in a specific didactic system.” Thus, we can conclude that under these conditions, the teacher and the student are separated by space, though not always by time, and communication takes place through interactive technologies.

The convenience in terms of time and space that distance learning provides makes it most accessible and attractive to modern schoolchildren and students. However, despite the obvious advantages, there are a number of problems that need to be addressed. These include hidden costs, misuse of technology and the attitude of teachers, students and administration. Each of these problems affects the overall quality of distance learning as a product.

The quality of training largely depends on the attitude of the teacher. Studies by Inman and Kerwin [8] showed that teachers have a contradictory attitude to working remotely, with most of them rating the quality of education as average or low. They attribute this to the fact that many teaching staff do not use modern interactive technologies when developing and conducting courses, a refusal explained by the fact that the development of such materials takes a substantial amount of time, unremunerated by the top management. However, in the work of Narbut et al. [9], it was shown that teachers recognize the need to introduce online technologies into the educational process, with half having no categorical objections to this new training format.

Sherritt [10], in a survey of higher education leaders, noted that many consider distance-learning programs as secondary, a “necessary but deficient form of education” (p. 2). They are dissatisfied with the poor working conditions and isolation, as well as personal and professional hardships. Such an attitude hardly contributes to the creation of an effective learning environment for students.

As for students, distance learning is not suitable for all of them, nor are all disciplines well-taught through this format. Pleshakov and Sklyarova [11] commented that, depending on the ability of the students and teachers to organize the process remotely and indeed to understand the spirit of the enterprise, the student finds themselves immersed either in the actual educational activity or in a pale imitation. Most likely to succeed with it are mature students, often possessing essential characteristics a tolerance for ambiguity, an understanding of the need for autonomy and the ability to be flexible [12]. Hardy and Boaz found that “compared to most face-to-face learning environments, distance-

learning requires students to be more focused, better time managers and to be able to work independently and with group members" (p. 43). Many distance-learning students differ from traditional undergraduate students in that they already work in their specialty, have clearly defined goals and are more motivated [13]. Undergraduates also need the attention of teachers: in situations where face-to-face communication and intimacy are limited, students cannot be disciplined or supported through eye contact and body language [14]. It has long been known in psychology that students need to receive gnostic emotions and motivation to ensure thinking and intelligence [15].

The development of distance learning has become one of the main thrusts in the field of education: especially relevant at present when the world is experiencing a pandemic. One of its biggest advantages is the independence from time and place. Goncalves and Souza [16] showed with the example of Portuguese students that, in general, students are satisfied with the online format to a sufficient extent. Difficulties arise only with the organization of practical (laboratory) work. Other than this, one can study (or teach) at any time and place, thus creating bridges between different populations and cultures, which in turn enriches the exchange of information and knowledge [17]. Interviews with ADL (Asynchronous Distance Learning) students also showed that most students would like to have face-to-face training in addition to ADL, leading to the creation of a BL (blended learning) environment [18]. Petko et al. [19] concluded that students' ideas about the effective use of ICT are most predominant in teaching mathematics, literature and natural sciences.

The research also shows that students are interested in using digital technologies in teaching [20]. In order to extend the role of education, teachers are beginning to use non-traditional tools [21]. Wan et al. [22] found that the previous experience of working with ICT and virtual competence are two significant factors influencing distance learning and have a positive impact on its results. Yashina, Goreva [23] and Murzina [24] emphasized the importance of training competent specialists who are able to study independently, work with information and improve professional skills in the field of information technology. Moreover, the results of the study by Almazova et al. [25] showed that the problems faced by university teachers are as follows: the level of computer literacy, the electronic environment and support of the university, and the readiness of the teaching staff and the readiness of students for online learning, the latter two being the most important obstacles.

Part of the research on distance learning was aimed at analyzing the factors contributing to its effectiveness, with the study by Manochehr [26] finding that students with an assimilating or convergent learning style achieve better results in distance learning. Gomez et al. [27] studied which activities can be used to support different learning styles in this field. Research by [28,29] also showed that student characteristics and their social intelligence could play a big role in learning outcomes.

Even in the study of Salamon [30], it was shown that the technological aspect of the learning process is the least significant since technological tools develop over time and solutions to various problems and difficulties are introduced. The authors of [31–36] noted that the support and encouragement of students in the process of distance learning, together with the level of interaction between the teacher and the student, can influence effectiveness here. Miller et al. [37] conducted in-depth interviews among university teachers and found that they consider it important to be physically present in one learning space. Here, emotional and social connections are formed, which, in turn, positively affects the effectiveness of teaching and learning. The researchers conclude that the suitability of online learning varies for each type of student.

An analysis of the literature shows that studies of the problem of remote education affect various aspects. Dubey and Pandey [38] outlined the general problems faced by higher education institutions in India and the possible measures that could be taken in the current situation to ensure continuous learning. They also discuss the need for a "Paradigm shift in thinking" among students to adopt digital education rapidly. Samorodova et al. [39] noted a discrepancy between the ideas of teachers and their students regarding the effectiveness

of certain forms of online education while studying the effectiveness of communicative methods of online learning. The problems of student motivation and students' attitudes to distance learning are considered in the works of Smith et al. [40], Abu-Khalil et al. [41], Sagin [42], Kolesnikova et al. [43,44] and Ryabikina et al. [45].

Kolesnikova et al. [44] conducted a survey of medical university students, studying their attitude to distance learning. A positive attitude among a majority of students was noted, with the caveat that the quality of distance learning is often lower than the traditional kind.

Thus, the problems of distance learning affect various aspects of education, including the study of students' attitudes to this form of education.

Accordingly, the question has arisen of how schoolchildren and university students relate to distance learning, its various parts and components, and its technological and content factors. The search for an answer to this question has, indeed, become the basis of our research.

In connection with this, in 2021, we organized and conducted a study of attitudes to distance learning among students and schoolchildren. The purpose of the study was to ascertain the peculiarities of the subjective attitude of schoolchildren and students to distance learning and to determine their subjective assessments of the advantages and disadvantages of distance education.

In the article, there is an analysis of the publications on the stated problem. The results and the discussion of the study are also described.

### 3. Materials and Methods

One hundred and forty secondary school students took part in the study (average age  $M = 10.7$ ,  $SD = 7.2$  (66.3% men)), 25.7% of them studying in middle classes (7–9 grade) and 74.3% of respondent's at high school (10–11 grade); 30 university students also participated in the study (average age  $M = 22.5$ ,  $SD = 2.4$  (20% men)).

The main method of research was by questionnaire, with two such developed by the author's team being used. Initially, the questionnaire "Attitude to distance-learning" was developed from 8 questions with a simple alternative answer. The following characteristics were studied: emotional attitude to distance learning, subjective assessment of the level of complexity of distance learning, subjective assessment of success in distance learning, time spent on independent work, availability of direct contact with the teacher, difficulties of distance learning and the willingness to continue learning remotely.

The questions therein were compiled on the basis of conversations with subject teachers from secondary school (teacher 1 had 7 years of teaching experience; teacher 2 had 11 years of teaching experience; teacher 3 had 15 years of teaching experience).

The questionnaire "Advantages and disadvantages of distance-learning" includes 52 closed-type questions, two of them with a simple alternative answer about the assessment of learning motivation and the level of academic load, with the remaining 50 questions assuming a dichotomous answer (selected/not selected). At the same time, 22 questions were devoted to the advantages of distance learning, and 28 to disadvantages: the prime focus in the questionnaire's creation.

The questionnaire questions were compiled based on an analysis of the advantages and disadvantages of distance learning [13,18–20,46].

The questionnaire procedure was conducted in person, in the same conditions for all respondents (audience, 1.5 m between the survey participants, identical forms and writing materials). The questionnaire form is group, blank. It offered respondents the chance to read the questions and choose the most appropriate answer, and the procedure was anonymous; it was conducted during the forced introduction of distance learning during the COVID-19 pandemic (2021). The transition to the remote method took place in waves, depending on the epidemiological situation in the region. Accordingly, the possibility of conducting a face-to-face questionnaire presented itself when changing the remote format to face-to-face.

Distance learning, both for schoolchildren and students, was organized synchronously, without breaking the usual schedule, on the basis of Zoom, Google Meet, Skype, Discord and other services. The university also used the Moodle platform to create asynchronous e-learning courses. Secondary schools use the Moodle, Google Classroom platforms and digital educational platforms: Russian e-school, Mobile e-education, Teach. ru, Yandex.Textbook, Online school Foxford.ru, Yaklass.ru, 1C: School and others.

Informed voluntary consent was obtained from each of the participants included in the study.

The purpose of the study was formulated thus: to study the peculiarities of the subjective attitudes of schoolchildren and students to distance learning.

The research objectives were to analyze current research on the attitudes of schoolchildren and students to distance learning, consider the features of subjective attitudes to it amongst schoolchildren, describe the advantages and disadvantages of distance learning as voiced by schoolchildren and students and conduct a comparative analysis, and to compare the advantages and disadvantages of distance learning in the opinions of schoolchildren and students with attitudes to this form of education.

The statistical procedures used were the Chi-square test for comparing theoretical and empirical distributions, the Chi-square test for comparing several empirical distributions and Fisher angular transformation.

The assumptions tested were as follows:

**Hypothesis 1 (H1).** *Various components of the subjective attitude to distance learning can be relied upon to be unequally distributed among schoolchildren.*

**Hypothesis 2 (H2).** *The level of self-assessment regarding motivation to study remotely, together with subjective assessment of the resulting academic load, can be distributed unequally in a group of schoolchildren and students. Moreover, the frequency distribution of the level of self-assessment of motivation and subjective assessment of academic load in distance learning can have significant differences in groups of schoolchildren and students.*

**Hypothesis 3 (H3).** *The attitude to distance learning (positive and negative) may be excellent in groups both of secondary school students and students.*

**Hypothesis 4 (H4).** *Schoolchildren and students may have different frequency distributions of advantages and disadvantages of distance learning.*

Regarding the content of the assumptions put forward, it is necessary to indicate that the study was conducted in two stages. In the first stage, the questionnaire "Attitude to distance-learning" was used, given our assumption that subjective assessments of various aspects of distance learning of schoolchildren are not accidental. At the second stage of the study, an expanded questionnaire, "Advantages and disadvantages of distance-learning", was used, and a comparison group (students) was introduced. We assumed that the self-assessment of motivation to study, and the subjective assessment of the academic load, would vary both among schoolchildren and students. We also suggested that self-assessment of motivation and subjective assessment of the academic load may be different for schoolchildren and students since at the university, a large proportion of academic time is devoted to independent work.

Finally, we also assumed that schoolchildren would have a less positive attitude to distance learning and that subjective assessments of the advantages and disadvantages among schoolchildren and students would be fundamentally different.

#### 4. Results

In the beginning, a questionnaire "Attitude to distance-learning" was conducted. The survey was attended by 60 students from the 11th grade of secondary school (35% men). The assumption that components of the subjective attitude to distance learning can reliably

be unequally distributed among schoolchildren (Hypothesis 1) was tested using the Chi-square test for comparing theoretical and empirical distributions. It was established that the emotional attitude to distance learning, subjective assessment of the complexity of distance learning, subjective assessment of success in distance learning, time spent on independent work, availability of direct contact with the teacher, difficulties of distance learning and willingness to continue remotely learning are distributed unequally in the empirical group (Table 1).

**Table 1.** Distribution of components of subjective attitude to distance learning in a group of schoolchildren.

Indicators of Subjective Attitude to Distance Learning	% Category	Chi-Square Test	<i>p</i>
Subjective assessment of the level of complexity of distance learning	"Easy" 100	-	-
Emotional attitude to distance learning	"Like" 90 "Dislike" 10	38.4	0.000
Subjective assessment of success in distance	"High" 1.7 "Average" 98.3	56.067	0.000
Time spent on independent work	"1 hour" 88.3 "1–3 hours" 10 "less than 1 hour"	82.3	0.000
Availability of direct contact with the teacher	"Available" 98.3 "Little available" 1.7	56.067	0.000
Difficulties of distance learning	"Lack of live communication with the teacher" 50 "Lack of live communication with classmates" 14.9 "Insufficient knowledge of computer technology" 6.8 "Difficulties with time allocation" 27.1 "No difficulties" 1.4	52.267	0.000
Willingness to continue learning remotely	"Ready" 3.3 "Not ready" 96.7	65.297	0.000

The results of the first series of the study attracted attention with some contradictions. For example, most of the students have a positive attitude to distance learning (Table 1) but do not want to continue studying in this form voluntarily. Moreover, indicating the sufficiency of communication with the teacher, 50% of respondents call it a disadvantage, the same applies to difficulties with the allocation of time. Due to the revealed contradictory results, it was decided to create a new questionnaire studying the advantages and disadvantages of distance learning. At the next stage of the research, 80 pupils of secondary schools (33.8% men) and 30 students (20% men) were interviewed.

It was revealed (Chi-square test for comparing empirical and theoretical distributions) that the level of self-assessment of motivation for distance learning and the assessment of the academic load is distributed unequally (Hypothesis 2) in a group of schoolchildren and students (Table 2).

Considering the results, we can conclude that both schoolchildren and students are significantly more likely to note that motivation in the distance format did not change or increase (Table 2). At the same time, there are no statistically significant differences in the groups of schoolchildren and students in the assessment of motivation in distance learning (Chi-square test = 0.883, *df* = 3, *p* = 0.829).

The volume of the academic load, according to schoolchildren, did not change or increase, while according to students, it actually decreased (Table 2). There are significant differences in the assessment of the volume of academic load in distance learning for students and schoolchildren (Chi-square test = 18.786, *df* = 3, *p* = 0.000).

**Table 2.** The level of motivation to study remotely and the assessment of the amount of academic load in a group of schoolchildren and students.

Group/Statistics	Motivation	Workload Volume
Schoolchildren	Increased—15	Increased—35
	Decreased—32	Decreased—15
	Not changed—46	Not changed—41
	I don't know—6	I don't know—8
Chi-square test ( <i>p</i> )	30.7 (0.000)	23.3 (0.000)
Students	Increased—16.7	Increased—20
	Decreased—23.3	Decreased—50
	Not changed—53.3	Not changed—13.3
	I don't know—6.7	I don't know—16.7
Chi-square test ( <i>p</i> )	14.533 (0.002)	10.267 (0.016)

Next, we ranked the advantages and disadvantages of distance learning, which were outlined by schoolchildren (Table 3).

**Table 3.** Advantages and disadvantages of distance learning, according to schoolchildren.

Advantages	%	Disadvantages	%
Reducing the chances of coronavirus infection	81.25	The difficulty of performing practical tasks without teacher explanations	61.25
Better visibility of slides compared to classroom lessons	52.5	Replacing training with self-study	53.75
Classes in comfortable home conditions	46.25	Relatives may distract during classes	43.75
Comfort clothing	41.25	Eyesight load	40
Body position	36.25	Interruptions with ZOOM platform (other platforms)	38.75
Absence of transport spending for independent study	36.25	Information is partially absorbed	38.75
Absence of communication with unpleasant people	33.75	A large amount of information spent for independent study	37.5
The training material remains available for download	33.75	Poor internet speed	32.5
Between classes, you can do personal things	31.25	Internet outages	31.25
can do personal things	27.5	Bad feedback	26.25
Economic benefit	22.5	Insufficient knowledge studying of PC	26.25
No fear of oral answers	21.25	Lack of "live communication" with classmates	25
No spending on lunch in the dining room or café	20	No physical education classes	25
Stress reduction	20	Power outage	22.5
You can manage the time yourself	18.75	The need to have internet access	21.25
There is time for self-development	16.25	Technical interruptions in the process of reproducing the material	20
Flexibility of the educational process	11.25	Absence of "live communication with teachers	18.75
No fear of being late for classes	8.75	Boring and monotonous	13.75
The release of time resources and the ability to build a schedule yourself	8.75	There is no feedback in communication with the teacher	12.5
Relaxed state	7.5	A large volume of specified materials	11.25
Fresh air	2.5	Concentration on studying at home is not always the case	10
The ability to combine work with study	0	There are few opportunities to study the material in detail during the lesson	8.75
		Untimely presentation of materials and assignments by teachers	7.5
		There is no feedback in communication with classmates	6.25
		No one to ask questions	5
		The need to listen to tedious speech with a text that is already in the presentation	1.25
		Insufficient amount of educational material	0
		Insufficient knowledge of computer technology	0

Further, the selection of the advantages and disadvantages of the distance-learning form of students (Table 4) was ranked.

**Table 4.** Advantages and disadvantages of distance learning, according to students.

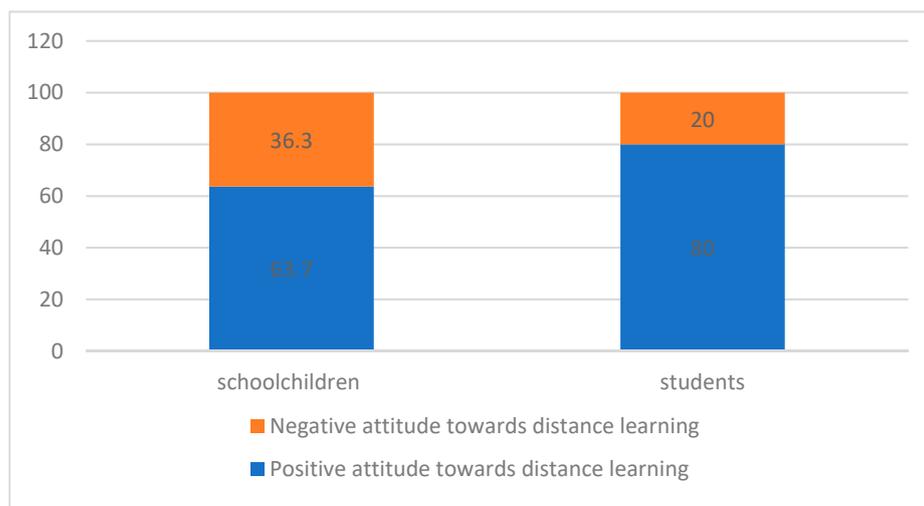
Advantages	%	Disadvantages	%
Absence of transport spending	90.00	Concentration on studying at home is not always the case	70.00
Reducing the chances of coronavirus infection	70.00	Lack of “live communication” with teachers	66.67
The ability to combine work with study	63.33	The difficulty of performing practical tasks without teacher’s explanations	60.00
Between classes, you can do personal things	53.33	Relatives can distract you during classes	60.00
Classes in comfortable home conditions	50.00	Internet interruptions	53.33
Relaxed state	50.00	There is no one to ask questions	53.33
Less study fatigue	46.67	Power outage	50.00
Lack of fear of oral answers	46.67	Absence of “live communication” with classmates	50.00
Economic benefit	46.67	The need to listen to tedious speech with a text	50.00
No spending on lunch in the dining room or café	46.67	No feedback in communication with the teacher	43.33
The training material remains available for download	40.00	Interruptions with the ZOOM platform (other platforms)	36.67
Fresh air	40.00	Bad feedback	36.67
Flexibility of the educational process	36.67	There is no feedback in communication with classmates	36.67
Comfortable clothes	36.67	Insufficient knowledge of PC	30.00
Body position	36.67	Untimely presentation of materials and assignments by teachers	30.00
Stress Reduction	33.33	Boring and Monotonous	30.00
Release of time resources and the opportunity to build a schedule yourself	30.00	No physical education classes	30.00
Absence of communication with unpleasant people	23.33	The need to have internet access	26.67
Absence of fear of being late for classes	20.00	Technical interruptions in the process of reproducing material	26.67
Better visibility of slides compared to classroom classes	20.00	Poor internet speed	23.33
There is time for self-development	20.00	Replacing training with self-study	23.33
You can manage the time	16.67	A large volume of specified yourself materials	16.67
		There are few opportunities to study the material in detail during class	13.33
		Insufficient amount of educational material	13.33
		Visual load	13.33
		A large amount of information for self-study	10.00
		Insufficient knowledge of computer technology	0.00
		Information is partially absorbed	0.00

The ranking procedure made it possible to compare the priority advantages and disadvantages of distance learning in groups of students and schoolchildren. The common advantage is “reducing the chances of infection with coronavirus”; the disadvantage is “the difficulty of performing practical tasks without explanations from the teacher”.

Further, the sample was divided into two groups with a positive and negative attitude to distance learning. The attitude to distance learning was determined by comparing the percentage of the selection of advantages and disadvantages to distance learning. Since the survey assumed multiple choices, the percentage of selected advantages and disadvantages was calculated. Respondents who chose, with significantly greater frequency, advantages rather than disadvantages were included in the group of respondents with a positive attitude to distance learning. The respondents that were significantly more likely to choose disadvantages were included in the group with a negative attitude to distance learning (Figure 1).

Using the Fisher angular transformation, it was found that students are significantly better at distance learning than schoolchildren ( $\varphi^*_{emp} = 2.588, p < 0.01$ ) (Hypothesis 3).

Testing Hypothesis 4 (Chi-square test for comparing several empirical distributions, the Fisher angular transformation) showed that schoolchildren and students have a reliably excellent frequency distribution of some of the advantages to distance learning (Table 5).



**Figure 1.** Distribution of students and schoolchildren with a negative and positive attitude to distance learning (in %).

**Table 5.** Frequency distribution of advantages and disadvantages of distance learning in groups of schoolchildren and students.

Advantage/Disadvantage	Schoolchildren (%)	Students (%)	Statistics
Reduction in study fatigue	27.5	46.7	$\varphi^* \text{ emp} = 2.835, p < 0.01$
Better visibility of slides, graphic material	52.5	20	Chi-square test = 9.37, $p = 0.002$
No fear of oral answers	21.2	46.7	Chi-square test = 6.964, $p = 0.008$
Flexibility of the educational process	11.2	36.7	Chi-square test = 9.475, $p = 0.002$
Between classes, you can do personal things	31.2	53.3	$\varphi^* \text{ emp} = 3.196, p < 0.01$
The ability to independently build a schedule	8.8	30	Chi-square test = 7.926, $p = 0.005$
Ability to combine work with study	0	63.3	Chi-square test = 61.245, $p = 0.000$
Relaxed state	7.5	50	Chi-square test = 25.514, $p = 0.000$
Fresh air	2.5	40	Chi-square test = 27.623, $p = 0.000$
Economic benefit	22.5	46.7	Chi-square test = 6.177, $p = 0.013$
No transport costs	36.2	90	Chi-square test = 25.222, $p = 0.000$
No costs for lunch in the dining room	20	46.7	Chi-square test = 7.822, $p = 0.005$
Internet outages	31.2	53.3	Chi-square test = 4.551, $p = 0.033$
Power outage	22.5	50	Chi-square test = 7.587, $p = 0.005$
Insufficient amount of educational material	0	13.3	Chi-square test = 11.069, $p = 0.001$
Untimely presentation of educational material by the teacher	7.5	30	Chi-square test = 9.379, $p = 0.002$
Absence of "live communication" with the teacher	18.8	66.7	Chi-square test = 23.091, $p = 0.000$
Absence of "live communication" with classmates	25	50	Chi-square test = 6.286, $p = 0.012$
There is no feedback in communication with teacher	12.5	43.3	Chi-square test = 12.543, $p = 0.000$
There is no feedback in communication with classmates	6.2	36.7	Chi-square test = 16.24, $p = 0.0005$
The need to listen to tedious speech, the content of which repeats the text of the presentation	1.2	50	Chi-square test = 41.716, $p = 0.000$
There is no one to ask questions	5	53.3	Chi-square test = 34.263, $p = 0.000$
Replacing learning with self-learning	53.8	23.3	Chi-square test = 8.142, $p = 0.004$
Large amount of information for self-study	37.5	10	Chi-square test = 7.587, $p = 0.005$
Information is partially absorbed	38.8	0	Chi-square test = 16.187, $p = 0.000$
Poor concentration on the learning process in home conditions	10	70	Chi-square test = 40.46, $p = 0.000$
Visual load	40	13.3	Chi-square test = 7.047, $p = 0.008$

Moreover, schoolchildren and students have a reliably distinct frequency distribution of some disadvantages to distance learning (Table 5). It should be noted that the number of distinct disadvantages of distance learning among students and schoolchildren exceeds the number of distinct advantages.

Thus, the formulated assumptions were partially or completely confirmed. This allows you to describe the content of the results obtained.

## 5. Discussion

Studies of the subjective attitude of schoolchildren to distance learning showed that 100% of schoolchildren note the ease of distance learning, and 90% say that they like this method. At the same time, the majority of the empirical group (98.3%) assesses the success of their educational activities with this method as average. Strangely, with the so-called ease of the distance method and the positive attitude of schoolchildren towards it, only 3.3% are ready to continue their education in distance form. That is, most schoolchildren accept distance learning as a necessity related to the prevention of the spread of a new coronavirus infection (COVID-19) and not as a preferred form of education.

Among the disadvantages of distance learning in the first series of the study, schoolchildren named the lack of live communication with the teacher, difficulties in time allocation, lack of live communication with classmates, insufficient knowledge of technology (given in descending order of the weight of the frequency of occurrence of the trait). A slightly different picture is revealed by the results of the study [45], which show that in distance learning, young people have more cognitive motives than social motives. There are also contradictions with other survey questions: for instance, 98.3% of schoolchildren note the availability of contact with the teacher, despite the fact that 50% of schoolchildren call the absence of direct communication with the teacher a difficulty. Here, though, we see that direct communication with the teacher is important for students. It is also contradictory that 88.3% of respondents spend 1 h performing independent work, but 27.1% call the “time allocation” a difficulty.

Schoolchildren are significantly more likely to note that the self-assessed motivation to study in a distance format has not changed and decreased, and the amount of academic load has not changed or increased. Students, on the other hand, coincide with schoolchildren in assessing motivation, but more often, they note that the academic load in the distance form has decreased.

Schoolchildren, more often, as advantages of distance learning, note a decrease in the chances of infection with coronavirus and better visibility of slides and graphic material (>50%). The least significant advantages (<10%) are identified by secondary school students as: absence of fear of being late, the release of time resources, relaxed state of mind and body, and fresh air. The opportunity to combine work with the study was not named as a virtue by any student.

The most significant disadvantages of distance learning, according to secondary school students, are (>50%) the difficulty of performing practical tasks without explanations and replacing learning with self-study. The least significant disadvantages of distance learning are identified by schoolchildren (<10%) as an insufficiently detailed study of the material in the lesson, untimely provision of materials for independent work, lack of feedback from classmates and decreased interest in the lesson due to monotony of speech. The items “insufficient amount of educational material” and “insufficient knowledge of computer technology” were not chosen by any student.

The results of the study showed that students more often note the advantages of distance learning (>50%) as no transport costs, reduced chances of infection with coronavirus, the ability to combine study with work, the ability to perform personal tasks between classes, classes in comfortable home conditions and a relaxed state between classes. In general, students more often than schoolchildren note the advantages of distance learning, with advantages being identified by less than 10% of the student group. The results obtained are consistent with the studies [20,38,46–48], indicating that, in general, students perceive distance learning positively.

As for disadvantages to the distance form, students often note (>50%) the difficulty of concentrating on studying at home, the lack of “live” communication with the teacher, the difficulty of performing practical tasks without an explanation from the teacher, the interference of relatives in the learning process in remote form; interruptions to the internet, power outages, the lack of “live” communication with classmates and the need to listen to tedious speech with text already in the presentation. Gunes [18] wrote about the

students' preference for live communication. The presence of difficulties for students in performing practical tasks was also emphasized [16]. Students consider less significant disadvantages of distance learning (<10%) to be a large amount of information for self-study. As compensatory mechanisms, it can be noted that in this case, students resort to manipulative techniques in teaching, for example, replacing creative work with texts from the internet and performing tasks with finding answers using a smartphone [49]. No student chose the items "insufficient knowledge of computer technology" and "partial assimilation of information".

Thus, it is of interest that the variety of choices among the student group both regarding advantages and disadvantages to distance learning is greater than in the group of secondary school students. Meanwhile, the leading advantage for schoolchildren and students is to reduce the chances of infection with coronavirus. The disadvantage of "the difficulty of performing practical tasks without the teacher's explanation" is underlined by both students and schoolchildren. However, the item "insufficient knowledge of computer technology" is not relevant in the group of students and schoolchildren.

It was found that students are more likely to have a positive attitude to distance learning than schoolchildren. This is also evidenced by the results of Elshansky's research, which revealed a positive attitude of students toward distance learning: students characterize it as "necessary, convenient and safe in this period, as well as quite effective, which allows them to gain the necessary knowledge and form professional competencies" [48].

In groups of students and schoolchildren, a number of advantages and disadvantages of distance learning differ. The visibility of slides and graphic material in the process of distance learning is more important for schoolchildren than for students. Other differences in frequency prevail in the group of students. The following advantages of distance learning are thus different and more significant for schoolchildren: reduction in fatigue from studying, absence of fear of oral answers, the flexibility of the educational process, that personal matters can be performed between classes, the ability independently to build a schedule, the ability to combine work with study, relaxed state of mind and body, fresh air, economic benefits, no transport costs and no lunch costs in the dining room. Students are more focused on independent time management, the ability to combine study with work and personal affairs and the economic benefits of distance learning; all these are also important for students. We can say that students are more ready for digitalization, new things and innovative activities generally, as confirmed by a number of studies [50].

The analysis of the disadvantages of distance learning, which are different in groups of students and schoolchildren, allows us to conclude that the disadvantages are more significant for schoolchildren than for students. These included the problem of replacing learning with self-study, a large amount of information for self-study, information being only partially assimilated and the load on vision. Secondary school students are more concerned about the educational process itself and the amount of material for self-study, as well as the load on the visual analyzer.

Other disadvantages that are different in groups of students and schoolchildren often prevail in the group of students. More significant for students are the following disadvantages to distance learning: internet interruptions, power outages, an insufficient amount of educational material, untimely presentation of educational material by the teacher, lack of "live" communication with the teacher, lack of "live" communication with classmates, no feedback in communication with the teacher, no feedback in communication with classmates, the need to listen to a tedious speech (the content of which repeats the text of the presentation), there being no one to ask questions to and poor concentration on the learning process at home. These characteristics, in particular, the need for live communication, are also indicated [16,18,51,52]. Students pay more attention to technical difficulties, a communicative deficit in teaching and an insufficient amount of educational material in distance learning.

## 6. Conclusions

The study of the attitude to distance learning of schoolchildren and students allows us to draw a number of conclusions.

1. Despite the supposed ease of this method, and demonstration of the positive attitude among schoolchildren to distance learning, only 3.3% are ready to continue their education in distance learning. That is, most schoolchildren accept distance learning as a necessity related to the prevention of the spread of a new coronavirus infection (COVID-19) and not as a preferred form of education;

2. Schoolchildren are significantly more likely to note that the self-assessed motivation to study in a distance format has not changed or decreased, and the volume of the academic load has not changed or increased. Students, on the other hand, coincide with schoolchildren in assessing motivation but more often note that the academic load in the distance form has decreased;

3. The variety of choices, both advantages and disadvantages, of distance learning in the student group is greater than in the group of secondary school students. The leading advantage of distance learning for both schoolchildren and students is to reduce the chances of infection with coronavirus;

4. Students are more likely to have a positive attitude to distance learning than schoolchildren;

5. Students in distance learning are more focused on independent time management, the ability to combine study with work and personal affairs and the economic benefits of distance learning. Schoolchildren, meanwhile, are concerned about the accessible visibility of the graphic material for the training session;

6. Secondary school students are more concerned about the educational process itself and the amount of material for self-study, as well as the load on the visual analyzer. University students pay more attention to technical difficulties, communicative deficits in teaching and insufficient amounts of educational material in distance learning.

The prospective solutions to this problem are the study of psychological and pedagogical factors determining the positive and negative attitude to distance learning, both among students of secondary schools and at university. Moreover, a significant vector in the development of this topic is the study of the psychological determinants of the development of a positive or negative attitude towards distance learning, as well as the study of the role of specific means and methods when organizing the educational process.

These studies can be used by the methodological services of secondary schools and universities to draw up recommendations for organizing the educational process in a distance form.

## 7. Patents

The authors declare the absence of patents.

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