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HOW LESSON FORMATS AFFECT THE MANIFESTATION OF THE PSYCHOLOGICAL PHENOMENA OF HIGH SCHOOL STUDENTS

Inna Mezhlumyan
Yerevan State University, Armenia, MS in Applied Psychology

ABSTRACT: During the quarantine caused by Covid-19, the demand for online learning increased. Many schools and universities around the world started using online platforms. However, since these changes occurred unexpectedly, some teachers and professors switched to online learning without acquiring the appropriate skills. Due to the neglect of the features of online education, the effectiveness of classes suffers. Therefore, it is necessary to understand the problems of online education, the obstacles, and the possibilities of their solution.

The purpose of the research is to evaluate and reveal their impact on the mental phenomena of high school students, particularly attention, memory, and motivation, through the study and comparison of distance and non-distance learning formats.

The research goals are:
1. Reveal the role of attention, memory, and motivation in educational activities through theoretical analysis.
2. Compare the forms of online and offline education and bring out their differences.
3. Reveal the manifestations of mental phenomena of high school students participating in distance and non-distance courses through experimental research.
4. Make conclusions by analyzing the received data.
5. Develop practical instructions for specialists in the field of education.

The research hypothesis is: Distance learning has negative effects on the mental phenomena of high school students, in particular, the manifestations of attention, memory, and motivation.

1. THE ROLES OF ATTENTION, MEMORY, AND MOTIVATION IN EDUCATION

Attention

Attention is an active state of wakefulness, during which the human mind focuses on responding to stimuli and exhibits a high level of sensory, intellectual, and motor activity. It has three types: voluntary, non-voluntary, and post-voluntary. Involuntary attention is realized when the organism is exposed to a stimulus of a certain force and does not require special efforts from the person. That is, this type of attention is less controlled because it depends on the strength of external stimuli. For example, when hearing a loud voice during the lesson, the student involuntarily pays attention to it, because the loud voice can be a powerful stimulus. Therefore, strong impulses can also distract the student from the lesson itself. Signs do not have to be bright, loud, large, etc. Their strength can also be connected with curiosity. For example, during an online class, when the teacher shares their screen to present the material, students may inadvertently notice files or pages with titles that interest them. This information affects their involuntary attention. However, this same phenomenon can also be used as a mechanism for focusing attention. Since involuntary attention requires no effort on the part of the student, its use can encourage activity. In other words, the student, noticing impulses that interest them, begins to show activity during the lesson without spending energy. For example, an English teacher who wants to develop students' vocabulary, uses a favorite movie or TV series appropriate for their age. Students immediately notice their favorite actors and characters, which are strong triggers for involuntary attention. Therefore, impulses that encourage involuntary attention are not only a distraction, but if used correctly, they can become tools for focusing attention.

Unlike involuntary attention, voluntary attention is controlled by the person. It is closely related to human self-regulation mechanisms. The main function of voluntary attention is the active regulation of mental processes. Since this adjustment requires effort, the student cannot focus their attention on the object for a long time. In addition, concentration is only one characteristic of attention, therefore other characteristics such as volume, portability, stability, distribution, observation, tension, and dispersion must also be taken into account. All these features have a special role in the educational process.

In addition to voluntary and non-involuntary attention, there is also a post-involuntary type. Unlike volitional attention, post-voluntary attention is activated by mediated interests. In the case of involuntary attention, the activity or material interests the student and they enjoy it without exerting any volitional effort. Even more so in the presence of involuntary attention, the power of motivation is great. In the case of post-voluntary attention, the student is not involuntarily interested in the material of the lesson, but during the lesson, they acquire an interest in the discussed topic. When being interested in that topic they no longer spend energy on voluntary attention and the process of perception becomes easier and more pleasant. Therefore, taking into account the phenomenon of post-voluntary attention, the teacher can present the material in such a way that it arouses interest in the class. In the case of activation of post-voluntary attention, students perceive and memorize the material more easily, without spending a lot of energy.

2. MEMORY

One of the functions of the brain is to receive signals from the environment, process them and respond accordingly. Our ability to respond effectively depends on our long-term memory system to store important information from similar situations in the past. This system also helps in the learning process. Memory helps the student to perceive the new material, find connections with the knowledge they already have, as well as memorize and reproduce the new information. One of the teacher's goals is that the students can remember what they learn and be able to use the knowledge they have accumulated in the future. Memory is defined as the phenomenon of memorizing perceived information, keeping it in the mental sphere, and later restoring and recalling it. There are several types of memory distinguished in psychology. For example, phylogenetic and ontogenetic memory are distinguished. The first one is inherited from parents. Meanwhile, ontogenetic memory refers to the contents acquired during the ontogenetic development of a person. In addition, voluntary and non-voluntary types are distinguished. As in the case of attention, here also both types have their special roles. Short-term, long-term, and operational types of memory are also distinguished. During the learning process, all three types have their role in learning effectiveness. Long-term memory preserves the knowledge that has already been passed, discussed, and kept in mind. And when studying new material, short-term and working memory are activated.

If we pay attention to lesson plans prepared by experienced teachers, we will see how the knowledge of memory mechanisms is introduced into the educational process. During the lessons, the students do not receive only completely new information, because in such a case, they would not be able to memorize it completely and reproduce it easily. Quite a lot of time is spent on repeating already learned information. Repetition can also be in the form of homework and teamwork. Sometime after the successful completion of this stage, testing and examination are also conducted so that the teacher can check how much the students are able to reproduce the information in long-term memory.

Before long-term memory is reached, the newly perceived information goes through the sensory memory stage, where only a part of the information reaches short-term memory due to attention concentration and selectivity. As a result of repetition and memorization, information is able to reach long-term memory. However, in order to retrieve information from long-term memory, reproduction is also necessary. The mental processing of received information and the thinking performed at the given moment take place in the working memory. There, we combine information from the environment with information from our long-term memory, then use both to make a decision or complete an action. The most obvious feature of the working memory system is its limited power. We are only able to process a small amount of new information at any given time. Therefore, during lessons, it is necessary to take into account the amount of new information given to students, because the working memory is limited. If, due

to lack of attention and selectivity, the information no longer reaches the operational memory, then it will not be able to reach long-term memory either. Therefore, overload leads to the loss of information. Either the incoming information is not being processed, or the information being processed is discarded for a new one. Processing in working memory is important for long-term retention. It is the "ticket" of information to long-term memory. Effective teaching results in students mastering the material in such a way that they can use it freely later on. In the learning phase, it is important to make an effort to create meaningful connections with previous knowledge, to clearly explain information, and to give specific examples. Incorporating more complex activities at this stage can lead to overload.

3. MOTIVATION

Motivation is seen as a driving force for learning and affects what, where, when, and how we learn. It affects the student's attention, involvement, and activity, which in turn are related to the knowledge acquired by them and the effectiveness of the educational process. It plays a major role in such processes as perception, concentration of attention, operant memory, coding of received information, etc. Therefore, for the effectiveness of the educational process, it is also necessary to take into account the motivational factors. One such factor is the dynamics of student-teacher and student-student relationships. Student-teacher relationships refer to those processes thanks to which the teacher motivates the students and arouses interest in the discussed material. However, the opposite effect can also be observed. By actively participating in the class, the students also have a positive effect on the teacher's motivation. Therefore, the student-teacher relationship is a dynamic relationship that can transfer positive energy and a high level of motivation from one to the other. In addition, the student-student relationship also plays a big role. First of all, different students can accept the same material differently. Therefore, by sharing and discussing, students get more information, adding their perceptions and views to the general information. For example, when one of the students has difficulty in a topic while preparing for an exam a classmate can help by explaining the same material in their own way. Although the same information may be conveyed in the end, by presenting it in their own words and concepts, students can help each other understand the material. The same can also happen during distance classes, through online communication.

4. ONLINE VS OFFLINE EDUCATIONAL ENVIRONMENTS

Offline

The format of offline education is also called traditional because it has been accepted since thousands of years ago. It also means that a lot of research has been carried out, and many methods, methodologies, and programs have been developed for the traditional educational format.

The most important feature of the offline format is the physical classroom. It is a social system where students and teachers acquire their own special roles. By attending school from an early age, children become members of a separate social system, where they acquire a new role, form relationships, and develop. In the case of a high school student, roles and relationships change over time, because their motivational system also changes. In lower grades, students are more interested in playing and making friends. And in higher grades, the educational process is more targeted. By high school, most students are already starting to make choices about their future. High school students choose a profession that interests them. The profession is not always chosen only for interest, the motive may be different, for example, a possible high salary, or fulfilling the wishes of parents, however, it still influences the student. They also start to choose universities and departments corresponding to their preferred professions. Therefore, their educational activities are more aimed at the future than the achievements and pleasure of that moment. This means that the activity of a high school student is more conscious than that of a junior and middle school student. By calculating what they need to achieve their goals, high schoolers make informed decisions. Of course, this feature also applies to distance courses. Despite the fact that in this case there is no physical class, the students still consciously strive for specific goals.

This goal orientation and motivation, however, differ in distance and traditional classrooms. The physical class creates group dynamics, a sense of unity, and direct contact. Despite the fact that the main motivating force in the educational process at this age is not the company, it still plays a big role in the life of a high school student.

Knowing that they will meet friends when they go to school, high school students feel more motivated. In addition, having friends in the same class can also support comprehension, as it is possible to discuss the lesson with friends and look at the same issue from different perspectives. Thanks to the activity of the group dynamics, the student-teacher and student-student connection is also improved, because their contact is as natural as possible, unlike distance courses.

In addition, the structure of the day is different. To participate in non-distance courses, the student gets ready, gets dressed, takes their bag, arrives at school, sometimes goes from one class to another, spends the breaks in the same building, with the same people, and returns to their personal life only after the last class. Therefore, there are only a few distracting circumstances, because they are in a different environment. With online courses, the student is mostly in their own room, can wake up five minutes before class, can stay in their house clothes, can leave the room at any time if it is possible to turn off the camera, and is surrounded by personal belongings that can easily distract them from class. In addition, they may also be distracted by family members, because they are the only ones attending the class.

However, non-distance courses also have their drawbacks. Although getting ready for school, leaving, and getting to school can allow students to focus on the learning process, they are also time-consuming, and nearly every day students spend hours getting to school and back. In addition, students must be physically present in the same place to attend classes. Therefore, the non-distance format is not as flexible as the format of online courses.

Online

The distance education format gained worldwide popularity during the Covid19 epidemic. Many schools and universities quickly switched to distance learning based on health requirements all over the world. However, even if the educational program and teaching materials remained the same, this format has its own characteristics, thanks to which the educational process differs from traditional classes.

The most obvious advantage of distance learning is convenience. This not only refers to the convenience of students to join the class from their own room but also to participate in the class from any geographical point. To attend the distance course, all you need is the Internet and a computer, or even a tablet or phone. These tools are now quite easy to obtain, which means that this system is more flexible since class attendance is not tied to the student's physical presence in the classroom. It gives the student the opportunity to travel, not leave the house if necessary, and have the opportunity to join the class even in emergency situations. In addition, this system saves students' time, because in order to participate in the lesson, it is not necessary to get ready, get to school, spend breaks at school, and return home. In this way, students have more time for doing homework and for their interests. However, it is necessary to take into account the possible hindering circumstances, such as the lack of Internet connection and the lack of computer knowledge.

Online classes also have their drawbacks. There are many distractions during online classes. They can negatively affect students' motivation and attention, as they have a high chance of distraction. In addition, it is much more difficult for the teacher to regulate the behavior and attention of students during distance courses. When there are other people in the house who are not participating in the class, they can make noise. There may be pets or small children in the house. In addition, there may be objects of more interest to the student in the room, which take their attention from the lesson. The same problem can be observed in the case of the teacher because the teacher is also not in the real classroom. Apart from that, the platforms of online courses can become an obstacle. One of the problems is turning off the cameras. By turning off the cameras, the students can feel more free because no one can see them. If no one watches their behavior, they lose their sense of responsibility. This circumstance can be noticed when almost no one reacts to what the teacher says during online courses. The ability to turn off the microphone also promotes this. It is a useful tool to avoid distracting sounds, but it also leads to a decrease in interactivity. Thus, the level of communication also decreases. In addition, communication also decreases outside of class, because students no longer spend their breaks together. After the lesson, they turn off the program used during online learning and do not see their classmates. Therefore, the group dynamics during distance and non-distance courses are different. An online classroom does not become the same type of social system as a physical classroom.

5. METHODS

The research is aimed to analyze students' attention, memory, and motivation.
The sample of the research is 40 participants. 20 of them are students participating in offline courses, and the remaining 20 are in online courses. Both groups are studying in the 11th grade and the lessons of both groups are organized by the same school. The lessons of the same subject and the same teacher were used for the observations conducted during the research. Research methods are passive observation, testing, and survey.

The analysis of the research results was carried out by mathematical-statistical methods.

1. Study of the selectivity of attention: The test consists of a series of 10-13 lines of letters, which contain 24 words. Words consist of more than three letters. The participants are given the test form and instructed to distinguish words among the letters.

2. Comparative study of active reproduction and recognition processes: The purpose of the test is to study the features of reproduction and recognition of the material. This test consists of two stages. During the first round, four sets of words are used. In the first row, there are 10 words that have no semantic connection with each other. In the second row, there are 20 semantically unrelated words, 10 of which are the words of the first row. In the third section, there are 15 words that have no semantic connection. And in the fourth section, there are 30 words with no semantic connection, 15 of which are the words of the third one. In the first stage, the researcher reads the words of the first row and asks the participant to reproduce them in any order. After that, the researcher reads the words of the second row and asks the participant to give a sign if he hears the words of the first row. The same is done with the words of the third and fourth rows. In the second stage, three matrices are used. There are 9 geometric figures in the first and second matrices. And in the third, there are 20 geometric images, 9 of which are from the second matrix. The participant looks at the first matrix for 10 seconds and after 5 seconds tries to draw the geometric images of the first matrix. Then they look at the second matrix for 10 seconds. After 5 seconds, they see the third matrix and must find the geometric figures seen in the second matrix among 20 geometric figures.

In addition to the mentioned tests, a survey and passive observation were also conducted.

1. The survey was aimed at the level of students' motivation. The purpose of the survey is to compare the evaluation given to offline and online courses by the students themselves. All questions were closed; thanks to which it is possible to objectively compare the data of the two groups.

The participants had to rate the following phenomena from 1 to 10.

- Level of motivation when participating in non-distance VS distance courses
- Level of motivation when doing homework for non-distance VS distance courses
- The importance of education in their lives
- Relations with classmates
- Relations with the teacher (the teacher of both groups is the same)

2. The observation was conducted during the lessons of the same subject and the same teacher. Before conducting the observation, separate lists were made, where the observed criteria were mentioned. As the difference between online and offline courses was studied, the criteria were adjusted to the formats. Certain features that have their influence on the effectiveness of learning were singled out. For example, one of the criteria for viewing an online course was whether the camera was on or off, which has an impact on the process of online courses, but is not a relevant criterion for offline courses. In this way, the circumstances affecting the course of the lesson were taken into account as much as possible.

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6. RESULTS OF THE EXPERIMENT

Observation

Two observations were made, one for an offline class and the other for an online one. General and format-specific standards were distinguished. The following table shows the results of non-remote class viewing. (green 1-2 times, blue 3-4 times, orange 5-6 times, red 7+ times) 19 out of 20 students were present in the class.

Table-1

	Attention on the board	Asking a question	Answering a question	Question not related to the lesson	Reacting	Adding information	Being late
Student1							
Student2							
Student3							
Student4							
Student5							
Student6							
Student7							
Student8							
Student9							
Student10							
Student11							
Student12							
Student13							
Student14							
Student15							
Student16							
Student17							
Student18							
Student19							

The absent student was ill and the teacher was informed about it. As can be seen in the table, the attention of 18 out of 19 students was on the blackboard, and the student whose attention was not on the blackboard was busy with the computer. However, it was the same book that the teacher was presenting, but the student sometimes opened other pages, as well as continued to look at the computer screen during the discussions. The second column of the table represents the frequency of asking questions by students. In total, 9 students asked questions, 5 of them asked more than 3 questions during the lesson. Thanks to their questions, the teacher explained the material more clearly. In addition, mostly after one student's question, some of the remaining students actively discussed the question, listened to the teacher's comment and sometimes asked more questions themselves. Therefore, thanks to the students' questions, the level of class activity increased. The third column represents the frequency of answering the questions. 13 out of 19 students answered the teacher's questions, and 11 of them did it more than 3 times. As can be seen in the table, 5 of the respondents are students who also actively asked questions. The next column deals with out-of-class questions, which were observed only once. However, the question given once and not related to the lesson was humorous and received a positive response from both the other students and the teacher.

The next column shows students' reactions to what classmates said. 8 out of 19 responded to the information or question given by classmates. Responses such as "good," "yes," "okay," and similar responses to the teacher's instructions were not recorded in this column, as they were performed almost every minute by the majority of the class. The next criterion is adding information, which is left blank. However, thanks to the question and answer during the lesson, the students actually added enough information, but this was not noted because it was not separated from the questions they were asked. Therefore, despite the fact that this column is empty, in fact, thanks to the discussions, information has increased, just not in a separate format. The last column deals with joining the class late. Only one student from the whole class came back late from recess. However, they were late for about 3 minutes and entered the class without disturbing their classmates.

During the observation of the non-distance course, the following facts were also observed, which were outside the intended criteria:

- The teacher's questions were often answered by the whole class, simultaneously.
- Phones were seen in the case of some students, but they were only used for the purpose of taking a picture of the blackboard. It was mainly used by the students sitting in the last row, for whom the blackboard was far away. After taking the photos, they enlarged the picture and made notes in the notebook. Therefore, in this case, the phone was not a distracting factor, but a helpful tool.
- About 6 of the students had computers in front of them. However, only one of them looked at the computer, mostly at the e-book, and the remaining 5 focused on the blackboard during the lesson, and only used the e-book opened on the computer when completing tasks. Therefore, in this case, too, the computer was not a distracting factor.
- During the lesson, students' laughter was often heard regarding the material discussed during the lesson. They did not deviate from the lesson, but they participated in the lesson with a good mood and humor. During the process, no inappropriate or distracting jokes were observed, and analyzing the teacher's reaction to the situation, this mood was perceived as motivating and acceptable. Thanks to the humorous approach, more students joined the discussions and Voiced their opinions.
- The presence of non-verbal communication in discussions was also observed. Sometimes the students asked or answered a question by pointing or other gestures, which was also positively accepted by the teacher.
- The class responded very actively to the teacher's "Is it clear?" "Are there any questions?" "Should we move on?" and similar questions. Most of them answered verbally, and the rest nodded. However, everyone actively responded.
- The lesson plan was very clear: recall the material of the previous lesson, discuss a part of the new material, complete an independent assignment, discuss the results, and move on to the next part. It can be seen from the students' behavior that this structure of the class is familiar to them and they know what to expect from the class. This structure is effective because the lesson begins with repetition, which helps students to recall and try to reproduce the previous topic. In this way, the teacher trains the transfer of information from long-term memory to operational memory. In addition, the independent work-discussion sequence stimulates both the ability of

students to solve problems independently and the skills of group discussion. This method is also useful for activating the dynamics of the group because the students regularly participate in discussions.

- There was a lot of noise during the discussions. However, the students' involvement in the discussion was noticeable. Despite the fact that the class became noisy and it was difficult to hear everyone, the interest of the students and the increase in the level of interactivity was noticeable.

The following table summarizes the results of observing the online lesson. Despite the fact that 20 students from this group participated in the post-viewing test and survey, only 17 attended the online lesson. (green 1-2 times, blue 3-4 times)

Table-2

	Turned-on camera	Asking a question	Answering a question	Question not related to the lesson	Reacting	Adding information	Being late
Student1							
Student2							
Student3							
Student4							
Student5							
Student6							
Student7							
Student8							
Student9							
Student10							
Student11							
Student12							
Student13							
Student14							
Student15							
Student16							
Student17							

When comparing these two tables, the color difference stands out. The online group table is mostly green and only has a few blue boxes. Green means that the mentioned operation was done 1-2 times, and blue means 3-4 times. From this color difference, it follows that the offline class was more dynamic and interactive, as it had more orange and red which meant doing the action more than 5 times. Since the online lesson is conducted on a computer and it

is impossible to know whether the student is following the lesson or has opened another page, the first criterion differs from the offline table. In this case the criterion is having the camera turned on, which shows a very low result. Out of 17 students, only one person had turned on the camera, which means that both the researcher and the teacher could only follow the behavior of one student. The second column shows the frequency of questions asked by students. Only 5 out of 17 students asked questions, and only 2 of them asked questions 3-4 times. 10 students answered the question, which is close to the result of the non-remote group. However, the number of answers is very different, because some of the students in the first group actively answered many questions. There are no out-of-class questions at all in the remote group. Out of 17 students, only 6 responded to what another student said. 2 students added information, but, unlike the first group, no discussion took place. The information was only added and the teacher continued to present the material. Finally, 2 people were late for class. Unlike the first group, the latecomers in this group joined the class 20-25 minutes late and missed a significant part of the class.

In addition to the observations mentioned in the table, the following notes were also highlighted:

- The teacher repeated the question 2-3 times because no one responds. Also, it is not possible to observe the reaction or even the presence of the students, because 16 of the cameras are turned off. Almost every question was followed by several minutes of silence, until either one of the students answered with a delay, or the teacher themselves gave an answer and moved on. Even when the teacher simply asked whether the material or the assignment was understood, after a long pause someone else would turn on the microphone to say "yes" or again, without receiving an answer, the teacher would move on. This proves that we cannot be sure that the student behind the switched-off camera is attentively following the lesson, or listening to the lesson at all, especially when the computer also gives the option to turn off the sound.
- The teacher's camera was also turned off, which made it difficult to perceive them. In addition, sometimes the voices of family members were heard, and people were heard entering the room. Also, when the teacher received a phone call during the lesson, they answered it and did not turn off the microphone during the conversation. The house bell could also be heard. In the process, sounds were also coming from the room of one of the students, which had nothing to do with the class at all. They simply forgot to turn off the microphone and, most likely, left the computer, because they did not respond to the teacher's remarks and did not turn off the microphone. It was finally turned off by the teacher when they figured out how to do it. In general, there were many distracting circumstances.
- Since the teacher was not very proficient with the computer, they needed too much time to open the material. Besides, it was not done in the right format. When sharing the screen, the group could see the teacher's entire screen, all the opened pages, and receive unnecessary information. The teacher even opened their email while sharing the screen which means that the students were getting redundant information.
- There was no clear lesson plan. There was no concrete structure that could be followed. Most of the class was like a university lecture. Interactivity was almost non-existent.
- After not getting any answers, the teacher finally started nominating the questions. At first, it took longer because almost a whole minute passed after the question was asked, while the chosen student turned on his microphone and tried to answer. However, noticing that the teacher can ask them a separate question, the students began to show willingness. The pauses were not as long as at the beginning, but the slight increase in activity lasted for a few minutes, as the lesson was already nearing its end.

Testing

After the observation, individual meetings were held during which the testing and survey were conducted. The purpose of the testing was to identify and compare the attention and memory of high school students learning with offline and online formats. The book "Methods of Assessment and Development of mental qualities of a Soldier" (H. Avanesyan, N. Harutyunyan, S. Hovhannisyan, L. Stepanyan, E. Asiryan, 2017) was used for testing. The first test examines the level of selectivity of the participant's attention. Since there were two evaluation criteria, two criteria were recorded for each participant: the performance time and the number of correct answers. In order to compare the results, we calculated the average value of the results, as well as compared the minimum and maximum values.

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Table-3

	N of participants	Min	Max	Average
Offline group	**20**	**87**	**146**	**124.65**
Online group	**20**	**157**	**188**	**172.65**

As can be seen in the table, all three values are higher in the remote group. This means that high school students studying in the online format needed more time to complete this task.
In addition, the number of correct answers was recorded, which is presented in the following table. In this case, on the contrary, the offline group leads.

Table-4

	N of participants	Min	Max	Average
Offline group	**20**	**18**	**24**	**22.1**
Online group	**20**	**18**	**21**	**19.7**

The next part of the testing was aimed at identifying the differences in the memory properties of the two groups. Again using the book "Methods of Assessment and Development of Mental Qualities of a Soldier" (H. Avanesyan, N. Harutyunyan, S. Hovhannisyan, L. Stepanyan, E. Asiryan, 2017), we used a test that verifies active reproduction and recognition. However, we divided the results into two parts, because the test tested both auditory and visual memory at the same time. The data obtained from the collection of auditory memory results are presented in the following table.

Table-5

	N of participants	Min	Max	Average
Offline group	**20**	**40**	**50**	**46.65**
Online group	**20**	**22**	**36**	**27.55**

This test also revealed the difference in visual memory results. In this case, the difference is not as big as in the case of hearing, but it is present. Some of the participants in the non-remote group managed to get the maximum value, which in this test is 18, which the remote group did not. The same is observed when looking at previous auditory memory results. The maximal result is 50, which is only present in the non-remote group.

Table-6

	N of participants	Min	Max	Average
Offline group	**20**	**15**	**18**	**16.95**
Online group	**20**	**9**	**15**	**12.1**

Interview
During the survey, participants were asked to rate their level of motivation in class and doing homework, the role of education in their lives, and their relationships with classmates and teachers. Both groups rated their level of

motivation regarding distance and non-distance courses. The following table presents the level of motivation of high school students of the offline test group during offline versus online lessons. (1-min, 10-max).

Table-7

	N of participants	Min	Max	Average
Offline lesson	**20**	**8**	**10**	**9.05**
Online lesson	**20**	**4**	**9**	**6.55**

The same question was also asked to the students of the online group. Although they now participate in distance learning, they also rated their motivation level higher in non-distance learning. And the members of the non-distance group, who also had online courses during the epidemic, preferred their offline classes. The similarity of these results is also noticeable. In both cases, the average rating for offline lessons is approximately 9 (9.05 in the non-distance group, 9.4 in the distance group) and about 6.5 for online lessons (6.55 in the non-distance group, 6.25 in the distance group). It is also interesting that the online group rated the offline lessons higher and online lessons lower than the offline group.

Table-8

	N of participants	Min	Max	Average
Offline lesson	**20**	**8**	**10**	**9.4**
Online lesson	**20**	**4**	**8**	**6.25**

The same question was also asked about doing homework. The results are similar to the results of the first question. Again, the offline group rated their motivation higher when doing homework for offline classes. There was a student who rated both of them 3.

Table-9

	N of participants	Min	Max	Average
Offline lesson HW	**20**	**3**	**9**	**8.05**
Online lesson HW	**20**	**3**	**8**	**5.1**

The same question was answered by the students of the remote group.

Table-10

	N of participants	Min	Max	Average
Offline lesson HW	**20**	**6**	**10**	**8.5**
Online lesson HW	**20**	**3**	**9**	**5.7**

The next question related to the importance of education in the participants' lives. Strangely, the two groups gave exactly the same answers, to the extent that the mean, minimum, and maximum coincide. In the case of both groups, the average score was 9.5, the minimum was 8, and the maximum was 10. These evaluations are quite high results and show that education has a great value for all 40 participants.

Table-11

	N of participants	Min	Max	Average
Offline lesson HW	**20**	**8**	**10**	**9.5**
Online lesson HW	**20**	**8**	**10**	**9.5**

It means that the difference in students' motivation is not directly related to the value of education. It also makes the assessment and results of the remote group more valuable, because their relatively low results are not related to the importance of education in their lives. For them, too, education is of high value, therefore, their low evaluation refers more to unfulfilled expectations than to general motivation.

The next two questions refer to the relationship with the classmates and the teacher. With these questions, we tried to see how students evaluate their student-student and student-teacher relationships. In both groups, there are participants who give higher marks. At least the values do not differ much. However, in the case of average values, the difference is greater. In general, there is no significant difference. It can be connected with expectations. By joining online classes, students don't have high expectations of interacting together. Therefore, most of them are not worried about that circumstance.

Table-12

	N of participants	Min	Max	Average
Offline group	**20**	**8**	**10**	**9.2**
Online group	**20**	**6**	**10**	**7.45**

As can be seen in Table-2, the remote course was very passive, only one camera was turned on and the students showed little activity. Compared to such a difference, the difference in the results of this question is small. This means that despite the difference we observed, some of the students participating in remote classes are not as dissatisfied with the arrangement as we expected.

The next question concerns the relationship with the teacher. In this case, there are also students with the highest evaluations in both groups. The minimum value in the remote group is only 4, and the minimum score in the non-remote group was 8. The difference in averages is quite large, with the non-remote group being 9.3, and the remote group being 6.8.

Table-13

	N of participants	Min	Max	Average
Offline group	**20**	**8**	**10**	**9.3**
Online group	**20**	**4**	**10**	**6.8**

The last question also referred to the level of communication and contact. The participants had to list the classmates with whom they communicate outside of class. It is not necessary for them to be best friends, but they should mention the people with whom they also communicate during class breaks and in their free time. Here the variations are greater because in both groups there are students who are either introverts or extroverts and have many other characteristics.

Table-14

	N of participants	Min	Max	Average
Offline group	**20**	**4**	**10**	**6.4**
Online group	**20**	**2**	**7**	**4.35**

7. CONCLUSION

1. Manifestations of such mental phenomena of a high school student, such as attention, memory, and motivation, influence the effectiveness of learning. Without appropriate motives, a high school student does not make an effort to understand and memorize the material. Their voluntary attention and memory depend on these efforts.
2. Offline and online learning formats have their advantages and disadvantages. However, in order to take advantage of online education, it is necessary to adapt the teaching methods to the given format, rather than using the same methods without any changes.
3. One of the most obvious problems in distance learning is managing classroom behavior. Behind the turned-off cameras, it is impossible to know if the student is paying attention or not. And interactivity suffers due to disabled microphones.
4. High school students feel more motivated during non-distance courses, value their relationships with classmates and the teacher more, and feel more motivated when doing homework. They also show better results in attention and memory testing.
5. The value of education is equal for students participating in online and offline courses. In both cases, it is highly prioritized.
6. From the above, we can conclude that the hypothesis proposed by us has been confirmed.

8. SUGGESTIONS

In order to make distance learning more effective, teachers can:

1. Make appropriate lesson plans, where the level of interactivity and communication is high. Group discussions and tasks will help with that. In addition, each class should have its own goals, which also contribute to the realization of more perspective goals. You can start the lesson by listing the goals and in the last few minutes of the lesson discuss together with the students which goals were achieved and what will be done in the next lesson. In this case, it is easier for students to understand the structure of the lesson.
2. Encourage turning on cameras and microphones. It is not necessary to force the students to do this, but you can think of interesting games and methods, for which the student will connect the camera and the microphone. For example, by making one day of the week "funny hats day", the teacher not only creates a humorous environment and a good mood, thereby motivating the students but also without forcing pushes the students to turn on the cameras and actively participate, because they have to show themselves in their funny hats. Such games and methods can be easily found on the Internet and there are so many of them that it is possible to find a suitable method for any subject. It is also important to note that the teacher's camera must always be turned on.
3. Create a class chat. Since one of the problems of distance learning is the lack of communication, the teacher can encourage this by using electronic platforms. Of course, only creating a chat will not have a great effect, the teacher should also propose interesting discussion topics and actively participate in the conversations. In addition, in order to improve teacher-student relationships, it is also necessary to have separate active contact with students, for example in the form of recaps and short personal meetings.
4. Hybrid format. To take advantage of both formats, the teacher can use the hybrid version of learning, which means using features from both. If the main courses are distance-based, offline meetings can be organized from time to time, either in the form of a course or simply for communication purposes. And if the main classes are non-distance, you can sometimes organize online discussions, for example before exams. In addition, in the case of a non-remote format, you can have a general group chat and individual chats with the students.