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Teaching «Fundamentals of Health» with the application of cloud technologies

Організація викладання предмету «Основи здоров'я» з використанням хмарних технологій

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Abstract

The aim of the article is to analyze the results of teaching the subject «Fundamentals of Health» in grades 5-9 in the conditions of distance learning with the application of cloud technologies. The following methods were used for the study: videoconferences, explanations, interviews, surveys, tests for formative and summative assessment, performing practical tasks, works, projects, compiling instructions to tasks, creating educational presentations and videos. The article substantiates the possibility of teaching the subject «Fundamentals of Health» in grades 5-9 using cloud technology and educational platforms in the conditions of distance learning, such as: Google Classroom, Zoom, Meet, Edpuzzle. The results of 5-9-grade students' academic performance were analyzed and it was found that grades 5, 6, and 9 showed a fairly high

Анотація

Метою статті є аналіз результатів організації викладання предмету «Основи здоров'я» у 5-9 класах з використанням хмарних технологій у дистанційному форматі. Для дослідження були використані такі методи: відеоконференції, пояснення, бесіди, опитування, тести для здійснення поточного та підсумкового контролю, виконання практичних завдань, робіт, проєктів, складання інструктажу до виконання завдань, створення навчальних презентацій та відеоматеріалів. У статті обґрунтовано можливість викладання предмету «Основи здоров'я» у 5-9 класах з використанням хмарних технологій та освітніх платформ у дистанційному форматі а саме: Google Classroom, Zoom, Meet, Edpuzzle. Проаналізовано результати навчальних досягнень учнів 5-9 класів та виявлено, що 5, 6, та 9 класи продемонстрували досить високий

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level of academic achievement, while for the students of 7th and 8th grades this indicator was quite low. The obtained results are explained by the difference in motivation, experience of blended learning and students' age psychological peculiarities, parents' inclusion in the educational process, various types of practical tasks. The prospects for further use of distance education are highlighted in the article. They include application of tried and tested cloud technologies, systematic and comprehensive professional development of teachers; teacher-parent cooperation, preparing guidelines for students' parents; adapting types of tasks and their content to the conditions of distance and blended learning; launching teachers' own YouTube channels.

Keywords: cloud technologies, learning platforms, distance learning, secondary education, Fundamentals of Health.

Introduction

The transition to distance education, caused by the COVID-19 pandemic, has become an unexpected and quite serious challenge for all participants of the educational process – educators, teachers, students, pupils and their parents. Yet according to UNESCO, in the 21st century, children will spend only 30-40% of their time at school, 40% will be devoted to distance education, and the rest will go to individual studies. Therefore, although distance education entered our lives quite spontaneously, it will remain with us in the future. This is the evolution of society. That is why developing and improving all aspects of distance education require considerable attention and careful organization.

When the quarantine was introduced, teachers faced a number of challenges. How to organize the educational process? What platforms should be used for distance education? How to meet children's demands? How to motivate to study?

Outlining the general approach to the above mentioned problems, it is worth mentioning that for instance, the international organization OECD promptly reacted to new realities and created a public database of available platforms and programs for all educational institutions, among which the prominent place was occupied by the platform Google Classroom (used in Ukrainian schools as well), thanks to supporting 28 languages (Prybylova, 2017).

рівень навчальних досягнень, в той час як в учнів 7 та 8 класів цей показник виявився досить низьким. З'ясовано, що результати зумовлені різною вмотивованістю, досвідом змішаного навчання та віковими психологічними особливостями учнів, включенням до освітнього процесу батьків, різними видами практичних завдань. Висвітлено пропозиції щодо використання у подальшій роботі дистанційної освіти: застосування вже перевірених та освоєння нових хмарних технологій; систематичне та системне підвищення кваліфікації учителів; співпраця педагогів з батьками та підготовка посібників для батьків школярів; адаптування видів завдань та їх змісту до умов дистанційного та змішаного навчання; ведення власного Ютуб каналу кожним учителем.

Ключові слова: хмарні технології, освітні платформи, дистанційна освіта, загальні середня освіта, основи здоров'я.

This way of educational process organization existed before the pandemic. It has been used to work with inclusive children (or those who are often ill), with gifted students, as well as to conduct research and projects, to revise the course content, for extramural education and, in case of interactive interaction between students and teachers.

It is known that the father of the remote mode was the English teacher Isaac Pitman (XIX century). The idea gained popularity only in the last quarter of the XX century. In Ukraine it appeared at the beginning of the XXI century, and only in 2004 its existence began to be regulated by normative documents.

In accordance with the structure of our research, the next section of the article, Literature Review, is devoted to analyzing the scientific works focused on the area of our study. Furthermore, the Methodology section presents the legal framework that forms the basis of the study, namely the current state educational documents regulating distance learning in secondary education institutions. It describes the base where the study was conducted, data collection tools, etc. The Results and Discussion section deals with the description of the experiment conduct and the presentation of its results in the form of snapshots of the platforms on which students worked, electronic schedule of Kharkiv Gymnasium № 14, the analysis of 5-9-grade students' learning outcomes. Conclusions are drawn in accordance with the stated purpose and

objectives, the results of the study are substantiated. The article presents the authors' position on the organization of teaching the subject «Fundamentals of Health» in grades 5-9 using cloud technology in the conditions of distance learning. The prospects for further research are also identified.

Literature Review

Distance education has become widespread and popular in recent years: it gained regulatory support, was advertised in popular science articles, obsessively offered by private schools to parents of children with special educational needs. However, only 182 Ukrainian schools actually practiced distance learning before the quarantine. It is interesting to note that in developed countries this index is also quite low (Komarova, 2020).

I. Ushkalenko and Yu. Zelinska (2018) distinguish three types of distance education: correspondent, electronic, online, and clearly describe the advantages and disadvantages of each of them.

According to O. Miastkovska (2015), distance education cannot replace traditional way of studying, yet, it can definitely act as a supplement to the latter.

D. Koller, co-founder of the powerful and popular educational platform Coursera, emphasizes equal access to education for all people and, in her opinion, only distance education can provide this opportunity.

Summarizing the research of the world leading psychologists, T. Kamenieva (2020) states that distance education can lead to irreparable consequences, in particular: reduced intellectual function of the brain and creativity, digital autism, insufficient psycho-emotional development, etc.

Most educators, researchers, practitioners (Adamova, & Holovachuk, 2012; Akimova, Savelieva, & Chernyshova 2014; Miastkovska, 2015; Prybylova, 2017) believe distance learning has its pros. It gives children an opportunity to practice at a convenient time and in different places, i.e. create equal opportunities for all students; helps to avoid psychological barriers; educates self-organization, etc. At the same time, there are a number of cons: information support infrastructure; lack of personal communication; impossibility of immediate practical knowledge application.

According to T. Sobchenko and S. Dotsenko (2019), the formation of digital competence of a teacher of natural sciences is quite important, as the constant improvement of digital technologies is a major factor in the modernization of education. Therefore, the authors believe that the organization of distance learning requires well-established digital skills, especially for teachers of general secondary education institutions.

Based on our own experience, we can add that communication with the student is very important for education, because modern education (especially distance education) tends to individualization. During the offline educational process, each student has the opportunity to ask questions and get answers immediately. Distance learning deprives students of immediate teachers' feedback. It may cause lack of interest, students' distraction. It is difficult for children to stimulate themselves to study individually, because they do not feel a part of the team, where there is also such a spur as competition (for example, to be the best student in class) or just an emotional discussion on a particular issue can facilitate learning.

During the lessons «Fundamentals of Health», students form beliefs about the priority of health as the main condition for the realization of human potential, a conscious attitude to their lives. Therefore, discussions always have an important place in the lessons. In our opinion, it is important to keep discussions in distance learning mode.

The following requirements are set for teachers working in the distance education system: to respond to letters very quickly; to praise students' efficiency; to set a clear schedule for online communication and strictly adhere to it; to create an atmosphere of psychological comfort, etc. It is important to buoy a favorable mood, emotional uplift. It is necessary to provide conditions for students' full self-realization, demonstrating their progress, boosting their self-affirmation and self-esteem.

One of the prior social tasks is to preserve and promote children's health – the state of their full physical, mental and social well-being.

L. Olsen and D. Allensworth (2012) underline the importance of children's health, which is a crucial prerequisite of their success. Therefore, promotion of students' health must be a high priority for the school and school curriculum. This will not only guarantee good progress in education, but will help maintain health in

extracurricular life and contribute to optimal physical, emotional, social and educational development of students.

Methodology

In Ukrainian schools, health-saving competence is provided through the educational field «Health and Physical Training», which is implemented through the integrated subjects «Fundamentals of Health» and «Physical Training». Nowadays acute respiratory disease COVID-19 caused by the coronavirus SARS-COV-2 is spread in Ukraine and worldwide, so it is the health teacher who should provide children with reliable information and science-based facts about the coronavirus in order to reduce fears and concerns about the disease. The UNICEF and NUS websites provide practical advice on «How teachers can talk to students about the coronavirus (COVID-19)». The United Nations Children's Fund (UNICEF) in Ukraine and the NGO «Smart Education», with the support of the Ministry of Education and Science of Ukraine, have developed distance lessons on coronavirus infection COVID-19 (Kharkiv Gymnasium № 14, 2020).

Therefore, the aim of the article is to analyze the results of teaching the subject «Fundamentals of Health» in 5–9 grades with the application of cloud services in the distance mode. The tasks of the article are as follows:

- to prove the possibility of teaching the subject «Fundamentals of Health» in 5–9 grades with the application of cloud services and learning platforms in the distance mode;
- to analyze learning outcomes of students of 5–9 grades;
- to outline the prospects of using this trend in further learning.

The study is grounded on the experience of general secondary education institutions (GSEI) on teaching the subject «Fundamentals of Health» in 5–9 grades with the application of cloud services in the distance mode, theoretical analysis of the actual GSEI documentation on the

organization of distance learning, information collection, formative and summative assessment on the course in 5–9 grades, surveying teaching staff, observation, evaluation, analysis and systematization of results.

The study is also based on state educational documents «Law on Education», the Concept of the New Ukrainian School, the Concept of Distance Education Development in Ukraine, Regulations on Distance Education of the Ministry of Education and Science of Ukraine, Guidelines for teaching subjects in general secondary education institutions in 2020–2021, curriculum for the integrated course «Fundamentals of Health», course schedule (Fundamentals of Health) for 5–9 grades in 2019/2020 academic year (II semester).

The study was conducted on the basis of Kharkiv Gymnasium № 14 of Kharkiv City Council from March to May, 2020. The total number of students is 383, among them: 5th grade – 101, 6th grade – 58, 7th grade – 60, 8th grade – 83, 9th grade – 81 persons. The study describes actual work experience. 65 GSEI teachers were also interviewed.

The data were collected through the Google platform, the Trello platform developed by Fog Creek Software, Edpuzzle, Classroom and other cloud technologies, which provided the opportunity to obtain sufficient empirical material (testing, questionnaires, surveys).

Results and Discussion

Kharkiv Gymnasium № 14 was among the first general secondary education institutions that posted an updated schedule of lessons on its website (Kharkiv Gymnasium № 14, 2020) with clearly defined cloud platforms and web services to conduct lessons (Letter of the Ministry of Education and Science of Ukraine No. 1/9-430, 2020).

Figure 1 shows the school schedule for 5-A grade of Kharkiv Gymnasium № 14 during the quarantine period.

	A	B	C	D	E	F	G	H	I	J	K	
1				ВИД РОБОТИ / ЧАС ОНЛАЙН КОНСУЛЬТАЦІЙ		ВИД РОБОТИ / ЧАС ОНЛАЙН КОНСУЛЬТАЦІЙ	5-A (У)	ВИД РОБОТИ / ЧАС ОНЛАЙН КОНСУЛЬТАЦІЙ		ВИД РОБОТИ / ЧАС ОНЛАЙН КОНСУЛЬТАЦІЙ	ВИД РОБОТИ / ЧАС ОНЛАЙН КОНСУЛЬТАЦІЙ	
2			понеділок	вівторок	середа	четвер	п'ятниця					
3	9.30-10.05 перерва 15 хв	1	Інформатика	Kin Classroom; Рабіна Classroom	Природознавство: Твої фіз.впра.	Zoom	Мистецтво	classroom	Укр.мова(1,3) Осн.здор.(2,4)	осн.здор.classroom	Фізична культура	63
4	10.20-10.55 перерва 15 хв	2	Укр.мова	zoom 5309383245	Математика	jp232gv classroom	Математика	classroom	Фізична культура	63v44rx	Іноз.мова(англ.)	AB classroom classroom
5	11.10-11.45 перерва 15 хв	3	Історія України (вступ до курсу)	zoom 4795859868 (89213)	Навчасмося разом	Zoom 9158544551	Укр.мова	zoom 5309383245	Математика	classroom	Математика	jp232gv
6	12.00-12.35 перерва 30 хв	4	Іноз.мова(англ.)	AB classroom, I.O. class	Іноз.мова(англ.)	I.O. classroom A, B. classroom	Математика	jp232gv classroom	Трудове навчання	Classroom' хлочник classroom tjm6ckh	Укр.мова	zoom 5
7	13.05-13.40 перерва 15 хв	5	Математика	тум 6027134238 пароль 066830	Прир.Мов пз Земля	classroom	Іноз.мова(англ.)	I.O. zoom (7958592814)A	Укр.література	zoom 5309383245	Зарубіжна література	Zoom 9
8	13.55-14.30 перерва 10 хв	6	Фізична культура	63vd4rx	Укр.літ	classroom	Зарубіжна література	zoom	Іноз.мова(англ.)	AB classroom I.O.classroom	Прир.Мов пз Земля	clas
9	14.40-15.15 перерва 5 хв						Російська мова	zoom 4680735910	Навчасмося разом	Classroom		
10							5-Б					

Figure 1. The school schedule for 5-A grade.
Source: the website of Kharkiv Gymnasium № 14 (2020)

From March to May, 2020, the integrated course «Fundamentals of Health» in 5–9 grades was taught on the web service Classroom, Edpuzzle and cloud platforms Zoom and Meet.

Kharkiv Gymnasium № 14 has been using elements of blended learning for more than five years, namely the «Flipped classroom»

technology using the Edpuzzle web service. The curriculum of Gymnasium № 14 states that since 2019 four times a semester teachers attend workshops on the introduction of blended learning technologies. During the quarantine, training videos and podcasts were posted on this web service.

Figure 2. The content on Fundamentals of Health on the Edpuzzle platform.
Source: the author's personal account on Edpuzzle platform.

The course «Fundamentals of Health» was created on the Google Classroom platform for 5–9 grades and student enrollment was organized. The training was organized in synchronous and asynchronous mode. Students were offered tasks in accordance with the topic of the lesson, short-term (online) and long-term deadlines for their implementation were set. All tasks were checked and evaluated. The tasks were composed according to a competency-based approach,

which involves interactive teaching methods. When selecting supplementary information for the lessons, special attention was paid to its content, which has to agree with students’ age characteristics, educational opportunities and their real needs. Thus, an educational trajectory was implemented, which contributed to the formation of students’ motivation to lead a healthy lifestyle.

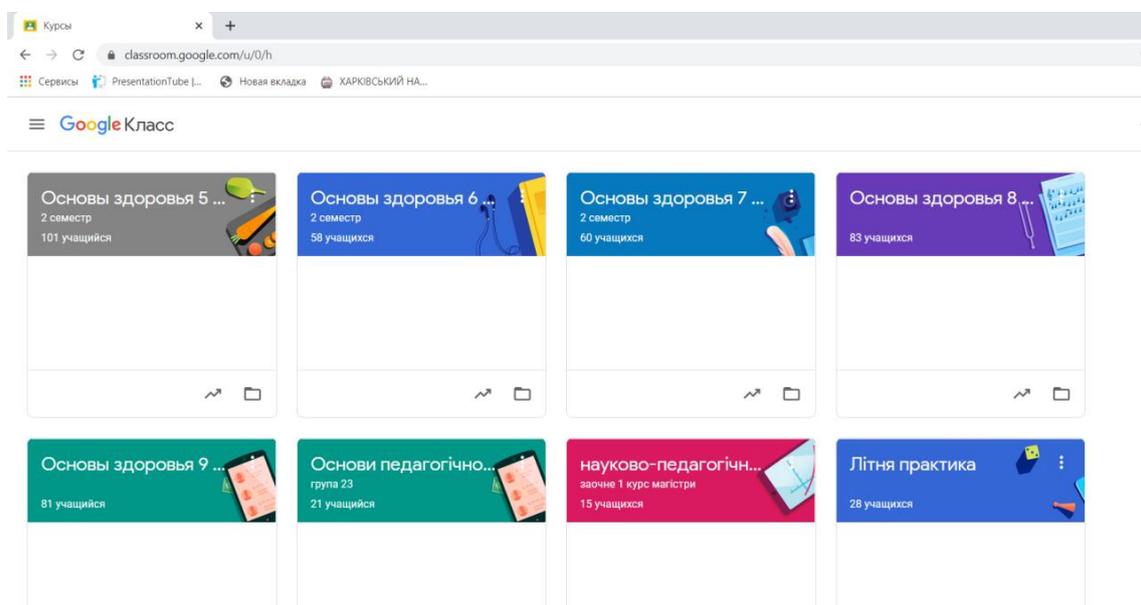


Figure 3. Teacher’s working page on the Google Classroom platform.
 Source: the author’s personal account on the Google Classroom platform.

Students’ learning outcomes were assessed in accordance with the indicative assessment requirements approved by the order of the Ministry of Education and Science of 21.08.2013 № 1222 «On approval of indicative requirements for assessment of students’ learning outcomes on the basic disciplines in general secondary education» (2013).

The object of assessment of students’ learning outcomes on the Fundamentals of Health is the emotional and value attitude to the surrounding

reality, following the rules of students’ behavior in real life situations, formation of skills.

Communication with students was organized through video conferencing on Zoom and Meet cloud platforms. During the meetings teachers explained the theoretical material on the topic of the lesson, interviewed students, conducted summative assessment, students asked questions, talked to the teacher and each other.

The levels of learning outcomes of 5th grade students are presented in Figure 4.

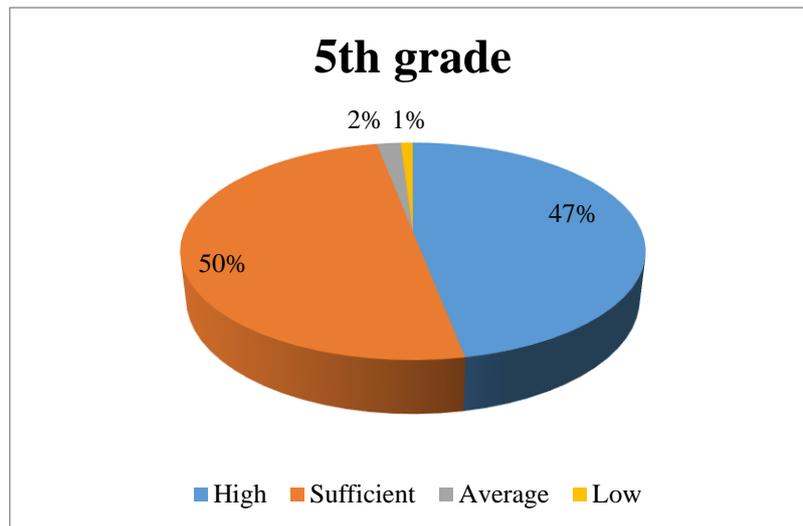


Figure 4. Levels of learning outcomes (5th grade)
Source: developed by the authors.

The high level of 5th students' learning outcomes (47%) is explained by fact that children aged 10-11 were able to easily adapt and switch to studying the course «Fundamentals of Health» online, either with the help of their parents or on their own. Our experience proves that students of 5th grade took the greatest interest in studying

the course in this format. They enjoyed completing e-tasks, especially, online projects that gave them a chance to demonstrate their creativity and imagination. The children remarked that during the quarantine they could devote more time to such activities. Figure 5 illustrates the progress of 6th year students.

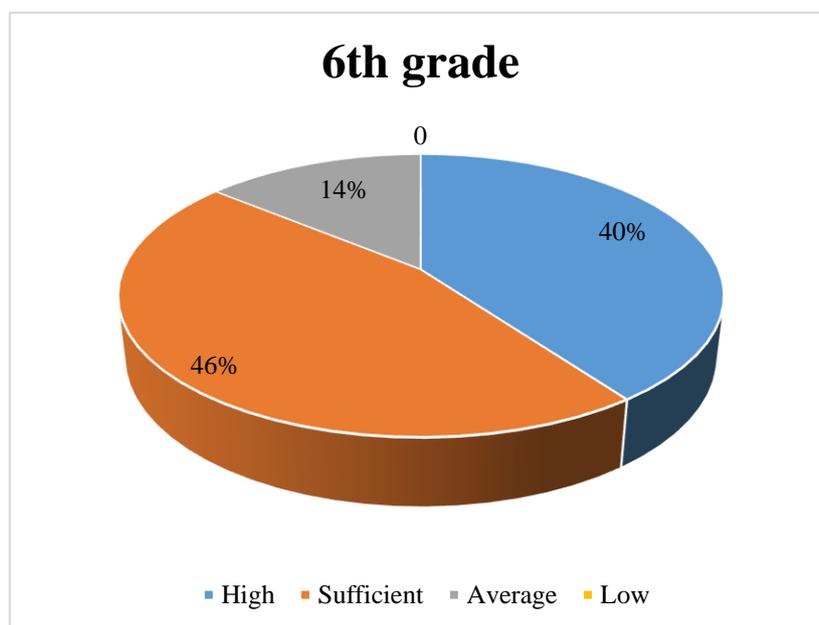


Figure 5. Levels of learning outcomes (6th grade)
Source: developed by the authors.

The majority of 6th grade students demonstrated high (40%) and sufficient (46%) levels of learning outcomes as they were already familiar with the elements of blended learning, namely «Flipped classroom» technology, which was introduced in the Gymnasium. The students

mentioned that they were mostly interested in posting educational videos, video and audio podcasts on Edpuzzle and video conferencing. The results demonstrated by 7th formers are presented in Figure 6.

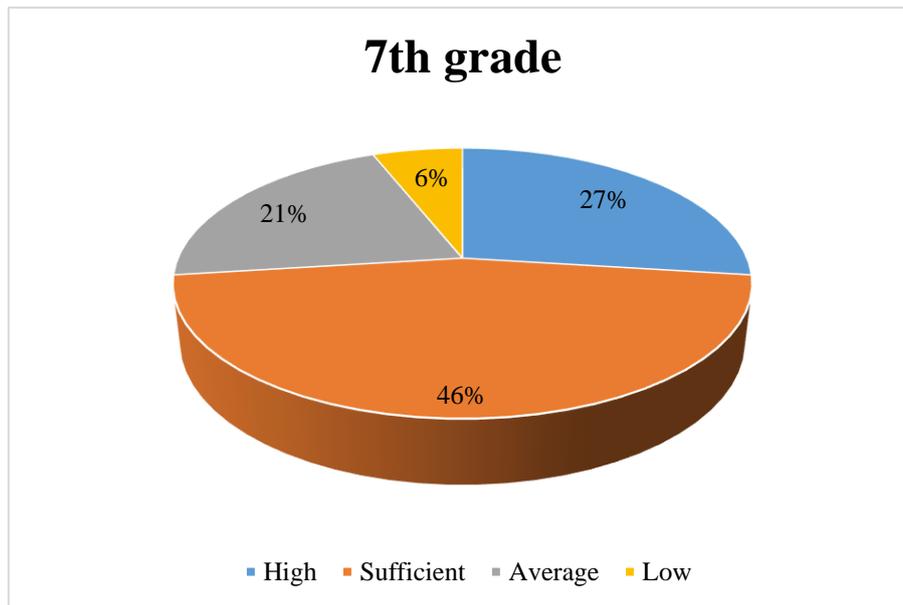


Figure 6. Levels of learning outcomes (7th grade)
Source: developed by the authors.

Such results of learning outcomes can be explained by the fact that younger adolescents (12-13 years) have reduced interest in learning. It is at this age that changes occur in children's

mental and physiological development. Teachers experienced difficult times getting the teens organized and engaged. Figure 7 concerns learning outcomes of 8th grade students.

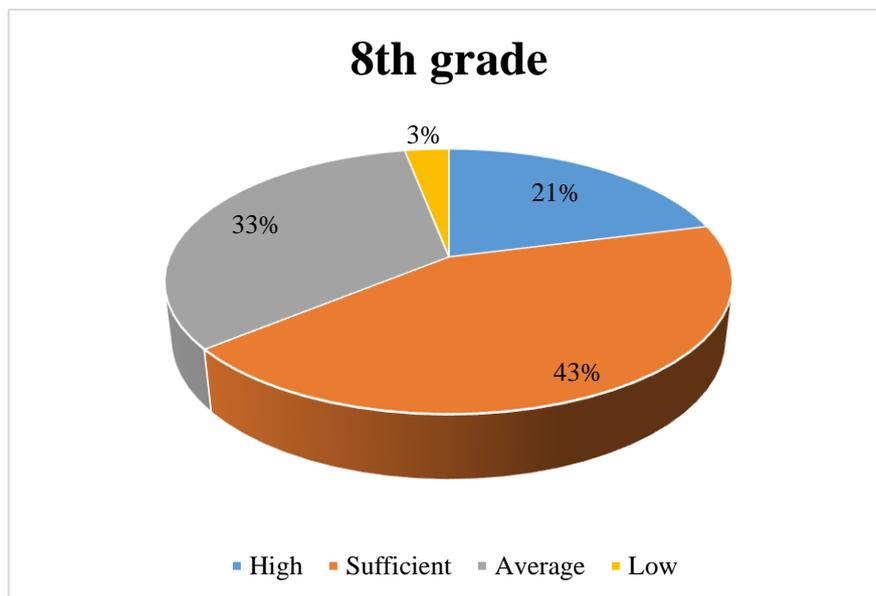


Figure 7. Levels of learning outcomes (8th grade)
Source: developed by the authors.

In 8th grade, lack of motivation, reluctance to learn hindered students' academic progress, which again can be explained by age-related

changes. The students worked on the Google Classroom, Zoom platforms. The results of 9th grade students are presented in Figure 8.

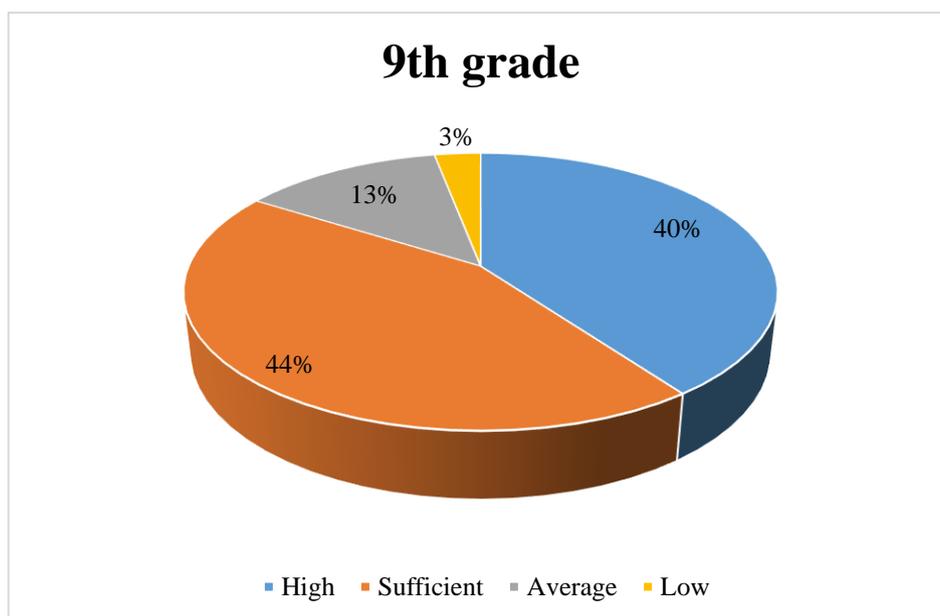


Figure 8. Levels of learning outcomes (9th grade)

Source: developed by the authors

In 9th grade, the course «Fundamentals of Health» is taught 0,5 hours per week. On the grounds of our own experience we find it worth mentioning that practical problem-based tasks and creative projects, scribing technologies on Google Classroom and Edpuzzle platforms work the best in the conditions of distance learning. These tasks fully corresponded to children's educational opportunities and their real needs. It should be stressed that the tasks were aimed at modeling certain life situations and contributed to the formation of skills that are developed during the course «Fundamentals of Health». 9th formers quickly got involved in the activities and worked really hard.

Thus, having analyzed students' learning outcomes on the subject «Fundamentals of Health» in 5–9 grades, we drew the conclusion that 5–6 students easily switched to online learning (video conferencing on Zoom and Meet cloud platforms). They also learned to work with Google Classroom, where they completed practical tasks. It can be explained by the fact that children had already had the experience of distance education gained with the introduction of blended learning technology «Flipped classroom». This is proved by indicators of high (47% and 40%) and sufficient (50% and 46%) levels of students' knowledge. It is worth mentioning that among 5–6 formers there was no one who did not get involved, or could not access the Internet, or did not have a means of technical training (a gadget, a PC, a laptop).

Regarding the academic progress of students in 7–8 grades, namely: high – 27% and 21%, sufficient – 46% and 43%, medium – 21% and 33%, low – 6% and 3%, there were certain problems and difficulties with online learning the subject «Fundamentals of Health». It was caused by both internal and external factors. Firstly, lack of motivation for learning due to age-related mental and physiological development. All teachers of the Gymnasium mentioned this fact during the interview. Secondly, about 8% of students in 7–8 grades did not have the opportunity to use the Internet, or did not get in touch for other reasons. This problem was solved successfully at the end of the school year. Those students got their tasks via Viber, Telegram, e-mail and completed them, but only in asynchronous mode.

The results of 9th formers, namely the high level (40%) and sufficient (44%) are attributed to the efficient organization of work, extensive use of various cloud technologies by the teacher and students' conscientious attitude.

Conclusions

In accordance with the aim we have analysed the results of teaching the subject «Fundamentals of Health» in 5-9 grades in the conditions of distance learning with the application of cloud technologies and drawn the following conclusions:

1. Teaching the subject «Fundamentals of Health» in 5–9 grades in a distance format is possible using the following cloud technologies and learning platforms:
 - organization of video conferencing with the help of Zoom and Meet cloud platforms (theory presentation, explanation, clarification, surveys, communication with classmates and teachers);
 - creating the course «Fundamentals of Health» in Google Classroom and students' enrollment (creating tasks, projects, practical work and providing instructions, posting educational presentations and videos, creating tests for summative and formative assessment);
 - students' registration on the Edpuzzle service (posting additional information in the form of educational video and audio podcasts).
2. The results of 5-9-grade students' academic performance have been analysed and justified. They testify that the highest indicators with high and sufficient levels of learning outcomes were demonstrated by students of 5th, 6th, 9th grades. The learners from grades 7 and 8 demonstrated lower results due to their age peculiarities characteristic of this period of learners' psychological and physiological development as well as to non-availability of access to the Internet. Thus, using cloud technologies when teaching the subject «Fundamentals of Health» online is expedient and justified.
3. We suggest the following steps to improve distance teaching of the subject «Fundamentals of Health» in 5–9 grades with the application of cloud technologies:
 - adaptation of the teaching methods taking into account modern online tools;
 - advanced teacher training (attending workshops, webinars, conferences, etc.);
 - using free popular learning platforms (HumanSchool, Edmodo), video platforms (Skype, WhatsApp), programs (Padlet, Flipgrid, ActivelyLearn, Storybird);
 - launching teachers' YouTube channel;
 - further introduction of blended learning technology «Flipped classroom»;
 - developing methodical recommendations for students and parents;
 - introducing electives to form a healthy lifestyle.

Finally, we should focus on the authors' position on the organization of teaching the subject «Fundamentals of Health» in grades 5-9 using cloud technology in the conditions of distance learning. It lies in the fact that the implementation of distance learning is not only a requirement of time and rapid development of information and digital society. The authors tend to believe that the distance format is in demand, has a positive effect on students' learning outcomes, provides students with the opportunity to reveal their personality and gives teachers the chance to demonstrate their creativity. The subject «Fundamentals of Health» is quite suitable for teaching in a distance mode, as proved by the results of the research and experience in teaching the discipline at school. Additionally, participants of the educational process benefit from the formation of their digital competence, which is among the key ones in the 21st century. However, the authors believe that the most effective is blended learning as it contributes to the formation of students' health-preserving competence and provides the opportunity to communicate with students both online and offline.

Prospects for further research include studying and testing modern cloud technologies when teaching the subject «Fundamentals of Health» in 5–9 grades in a distance mode, determining the degree of influence of various factors on students' academic progress

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