Simulation of Situational Tasks as a Method of Developing Safe Behavior Skills

Diana Amirova, Nazarbayev Intellectual School of Chemistry and Biology in Almaty, Kazakhstan
Nazigul Muratbekova, Nazarbayev Intellectual School of Chemistry and Biology in Almaty, Kazakhstan
Assem Zhomartova, Nazarbayev Intellectual School of Chemistry and Biology in Almaty, Kazakhstan
Zhanna Khadessova, Nazarbayev Intellectual School of Chemistry and Biology in Almaty, Kazakhstan
Zhaxybek Suleimenkulov, Nazarbayev Intellectual School of Chemistry and Biology in Almaty, Kazakhstan

The European Conference on Education 2024
Official Conference Proceedings

Abstract
This study is one of the important issues of modern society and reflects the general problem of Kazakhstan, the way out of which we see through a local solution, using a series of lessons within the framework of the Lesson study. In this regard, the study's purpose was to develop skills for responding to situations that threaten students' lives through the modelling of situational tasks in and out of the classroom. During the study, the following methods were used: lesson observation, input and output surveys, and modelling situational tasks to develop and improve skills in responding to situations threatening human life. The study also included broadcasting video materials and discussing news events in the country and the world. At the final stage of the study, we discovered outstanding results from the exit survey, which we reflected in the paper. Situational tasks were created and tested to develop students' safe behaviour skills in life-threatening situations, as well as increase students' responsibility for their lives and the people around them. The results of the input and output survey are confirmation of the relevance of the study. During the course of the research, we concluded that students' awareness of situations that violate the safety of human life has increased, which is confirmed by the results of the study. Furthermore, the results of the study showed the necessity to modify the perspectives and algorithms of actions of preventive and training activities in school, as well as to automate the school community's safe behaviour abilities.

Keywords: Safe Behaviour, Situational Tasks, Situational Approach, Life-Threatening Situations, Earthquake, Stress

Introduction

The study on the topic “Modelling situational tasks as a method of developing students’ safe behaviour skills” is one of the important issues of modern society as discussed by Peden et al. (2008), The World Health Organization emphasizes the need for robust child injury prevention measures.

Our research aims to solve an essential problem: improving students' response skills in life-threatening situations. The decision to conduct this study was driven by an awareness of the growing number of emergencies in society and the necessity to develop abilities to quickly respond to life-threatening situations. Situations that jeopardise the lives of students include stressful situations, and scenarios, such as those during fires, earthquakes, floods, and mudflows.

Ensuring safety in various aspects of life is a fundamental concern in modern society (Belov, 2010), that is why this research is important, since in our society there is an insufficiently serious attitude to all types of dangers and preventive measures, ignoring and negligent attitude towards training activities at school and in society as a whole.

In society, the statement "Kudai saktaydy" or "everything is the will of the Almighty" is frequently heard. However, statistics in the country demonstrate a high number of scenarios resulting in a huge number of victims and casualties (floods, earthquakes, fires, danger in mines and open pits, tours to the Charyn Canyon, etc.).

In this regard, the purpose of the study was determined to be the development of skills to respond to situations that threaten the lives of students through the modelling of situational tasks in class and outside of class.

Materials and Methods

The research work consisted of a series of lessons in the 8th grade "A" class over a period of five months (November-December-January-February-March). The lessons were conducted in accordance with the approved thematic plan, which included topics and objectives related to natural phenomena, dangers, and life-threatening situations.

Educational programs in life safety play a crucial role in developing the necessary skills for safe living (Abramova & Stankevich, 2017). The study employed a lesson-based approach that included modelling situational tasks to develop and improve response skills, conducting surveys and entry and exit questionnaires. Relying on data from real scenarios, expert opinions, and scientific-methodological literature, the research progressively refined teaching strategies to better prepare students for responding to life-threatening situations. As a result of the study, impressive survey results were found. At the very beginning of the research, an entry survey was conducted with the students, and an exit survey was conducted at the final stage. The survey consisted of three questions, which were the same for both the entry and exit stages.

The methodology of using situational tasks in teaching life safety, as outlined by Hanislamova et al. (2011), was integral to our research approach. The research was based on creating simulated situations, broadcasting video materials, and discussing news events in the country that involved life-threatening situations. However, during the course of the study, our

team encountered a real-life danger — earthquakes in the city of Almaty. The situation caught the school community off guard and inspired adjustments to future research.

We believe that modelling situational tasks is an effective method for developing students' skills in responding to critical situations and has several positive aspects in education. The situational approach creates realistic learning conditions by simulating scenarios that are as close as possible to real-life situations. This helps students better understand and retain the material as they see the direct application of theoretical knowledge in practice (Belov, 2010).

Moreover, the situational approach promotes the development of students' critical thinking and decision-making skills by requiring active participation in solving problem tasks. This stimulates their ability to analyse situations, assess risks, and make informed decisions.

Lazarus and Folkman (1984) present a framework for understanding the psychological processes involved in stress and coping. Their transactional model highlights the dynamic relationship between individuals and their environment, where stress is perceived as a result of an imbalance between demands and resources. This model is particularly relevant in educational settings, where students frequently encounter stressors such as academic pressure, peer relationships, and time management challenges. Lazarus and Folkman (1984) argue that the appraisal process—how individuals evaluate and interpret these stressors—is critical in shaping their emotional and behavioural responses. Primary appraisal involves assessing whether an event is a threat, harm, or challenge, while secondary appraisal considers the available coping resources and options. Effective coping strategies, as highlighted by Lazarus and Folkman, include problem-focused coping, which addresses the source of stress, and emotion-focused coping, which aims to manage the emotional response. In the context of our study, understanding these stress appraisal processes is essential. By simulating real-life stressful situations in a controlled environment, we can help students develop their appraisal skills and implement effective coping mechanisms, eventually improving their readiness to handle actual emergencies.

The situational approach boosts students' motivation and engagement in the learning process. By seeing the results of applying their knowledge and skills in practical situations, their interest in learning increases, leading to a deeper understanding of the material. The situational approach develops students' social interaction skills in the classroom. Joint task completion and role-playing games promote the development of communication skills and cooperation, which are crucial for the development of safe behaviour skills.

Thus, the use of a situational approach in studying the development of student safety skills is due to its ability to provide realistic, practice-oriented, motivating and socially interactive learning. This approach not only promotes better learning but also develops important life skills in students that are necessary for their safety and successful socialization.

Literature Review

The literature review on the research problem revealed a steady increase in natural, technological, and social emergencies, highlighting the need to address safety behaviour at all levels and identify numerous factors that lead to life-threatening situations. It was noted by Belov (2010) that a low culture of life safety in society, neglect of safety knowledge, occupational safety, and safe behaviour rules, along with irresponsible attitudes towards one's own life and health and the safety of others, are the main causes of critical situations. The

lack of a safety culture among the younger generation poses a threat to society, potentially leading to an increase in accidents and disasters in the future.

Moreover, Peek (2023) provides a detailed examination of how to develop capacities and resilience among children in disaster-prone areas. Her research emphasizes the importance of tailored educational programs that focus on building adaptive skills and emotional strength in young learners. By integrating disaster preparedness into the school curriculum, educators can help children understand the risks associated with natural disasters and equip them with practical strategies to cope effectively. Peek's findings highlight that adopting resilience in children not only prepares them for emergencies but also contributes to their overall mental well-being and confidence. Such initiatives are crucial in regions frequently affected by disasters, as they empower the younger generation to respond proactively and minimize the impact of catastrophic events on their lives.

Johnson et al. (2014) conducted evaluations of disaster education programs and found significant benefits in preparing children for emergencies. Their research indicates that structured and well-implemented educational initiatives can greatly enhance children's understanding of potential hazards and appropriate response actions. These programs not only increase children's knowledge about disasters but also improve their practical skills in emergency situations, such as evacuation procedures and first aid. Furthermore, the study shows that children who participate in disaster education programs exhibit higher levels of confidence and calmness during actual emergencies, reducing panic and improving overall safety outcomes. The findings underscore the importance of incorporating comprehensive disaster education into school curricula to build a more resilient and prepared youth population.

Researcher Abramova (2017) believes that life safety education, which adopts the development of specific knowledge, skills, and abilities in students, is essential for safe existence within the system of the "human-society-nature-technosphere." During the development of situational tasks, some materials such as role-playing scenarios and environmental safety projects from Khanislamova et al. (2011) methodological guide "Situational Tasks for the Course 'Life Safety'" were used. The authors of this guide consider situational and calculation tasks as tools for developing skills for safe interaction with natural, anthropogenic, and social environments, as well as the competencies necessary for future practical activities.

It is worth noting that the "situational approach" initially originated as a methodological foundation in the field of business education at Harvard University, USA. and has now spread to many areas of general and professional education. The situational approach is based on taking into account the specific conditions of the situation during the decision-making process. The category of "situation" is central to the methodology of the situational approach and is defined as a "combination of conditions and circumstances that create a specific environment or state" (Hersey, 1988).

Overall, the literature review on the research problem revealed that the modelling of situational tasks as a method for developing students' safe behaviour skills is widely studied by educators and scholars in the field of education. Academic works emphasize the importance of this method in developing skills in children and adolescents that are essential for their safety in various life situations.

Discussions

Before the study, the geography and English teachers of the particular 8th grade class collaborated to analyse the curriculum of these subjects and selected topics related to life-threatening situations through task modelling. For example, the topics include "The Impact of Climate on Human Life and Activities," "Life in the Ocean," "Being Stressed Nowadays," and "Environmental Problems of Kazakhstan," with objectives such as "assessing the impact on human life and activities (including additional local components)." Based on these objectives, sample joint lesson plans were developed. The planned lesson samples align with the learning objectives in the curriculum. The lesson plans included questions and situational tasks aimed at revealing the life-threatening situations' significance to students' lives. The tasks were designed to encourage students to analyse the provided information, make decisions, and offer their own suggestions.

Additionally, guidelines were provided to lead students towards independent research, action, and achieving results. These activities were organised in the form of individual work, pair work, and small group work. Methods such as document analysis in qualitative research, lesson observations, surveys, and interviews were used to collect data. Additionally, as a research tool, students' work based on a specially designed set of tasks was evaluated, and the results were analysed.

Lesson 1.

The first lesson was related to the topic of Stress. Understanding how students appraise and cope with stress is essential for effective simulation-based training (Lazarus & Folkman, 1984). This lesson study involved a carefully orchestrated scenario to observe students' reactions to a stressful situation created by the teacher of English.

Scenario description of the lead-in task of the first lesson: While the students were distracted by a dance activity, the teacher created a stressful situation by hiding the phone of one of the students on the windowsill. After the dance, the students were asked to open their phones and scan a QR code to play a game. When the student couldn't find her phone and started looking for it, another student who had seen the teacher take the phone informed her, which helped calm her down. The situation was then discussed, and the teacher apologised and introduced the topic of the lesson. This led to an open discussion where students shared their feelings and emotions.

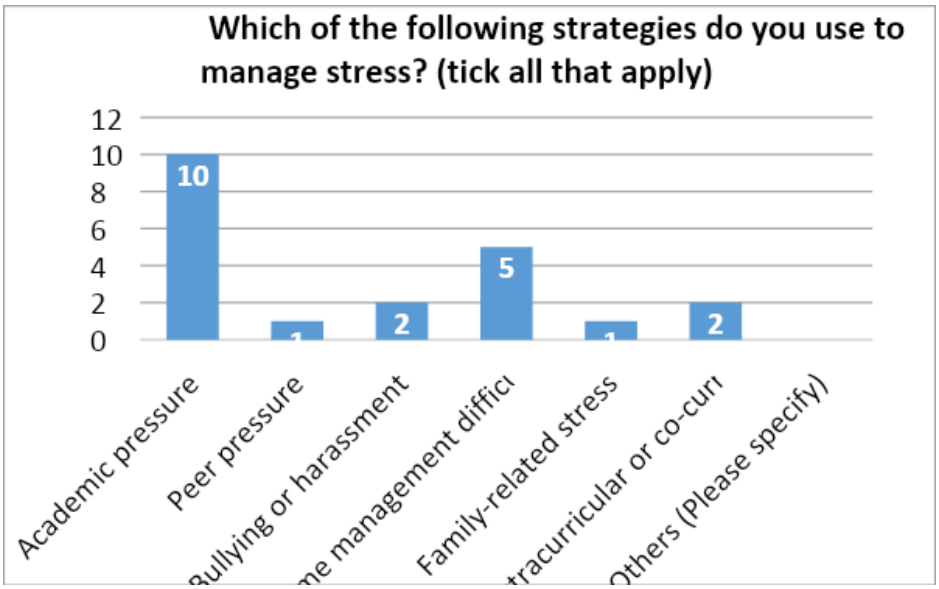

Figure 1. *Students' Answers to the Survey Regarding Stress Factors*

At the end of the lesson survey was taken where students identified various stress factors they face, including academic pressure (10 students), peer pressure (4 students), bullying or harassment (1 student), time management difficulties (5 students), family-related stress (1 student), and extracurricular or co-curricular pressure (2 students). Most of the students were confident or moderately confident when rating their confidence in managing stress. Students reported using various strategies to manage stress, including talking to a trusted adult such as parents or teachers (10 students), talking to friends (5 students), engaging in hobbies or activities they enjoy (4 students), taking breaks and practising relaxation techniques (4 students), and ignoring the stress and hoping it goes away (1 student). When asked if the school provides enough support and resources to manage stress, 6 students responded with "No," and another 6 students were "Not sure." Students reported how often they feel overwhelmed by stress related to schoolwork or activities: 3 students felt overwhelmed occasionally, 3 students frequently, and 5 students almost always. When asked if they had ever sought help or advice for stress-related issues at school, 6 students responded with "Yes" and 6 students responded with "No." This split response highlights a potential gap in the effectiveness or awareness of the school's support systems for managing student stress. On a scale of 1 to 10, students rated the importance of schools addressing and supporting students' mental health and stress management. Four students rated it between 1 (Not Important) to 5, while eight students rated it between 6 to 10 (Extremely Important). This inequality suggests that while there is a substantial acknowledgement of the need for mental health support, a portion of the students may either not fully understand its significance or feel that other issues take precedence. This variation in perception underscores the necessity for schools to not only provide mental health resources but also to educate all students on the importance and benefits of mental health and stress management programs.

The simulation revealed essential insights into the students' stress management capabilities and their perception of support provided by the school. The variety of stress factors highlights the multifaceted nature of the stress experienced by students, with academic pressure being the most common.

The understandings gained by students from the lesson were significant. Increased awareness of stress factors allowed students to better understand various contributors to their stress,

such as academic pressure, peer pressure, time management issues, and family-related stress, helping them to identify and address these sources more effectively. The simulation provided practical experience in handling stressful situations, teaching students to manage their emotions and reactions in real-life scenarios. Through the situational task, students enhanced their problem-solving skills by quickly assessing situations, communicating effectively with peers, and taking appropriate actions to resolve issues. The scenario encouraged the development of critical thinking by prompting students to analyse their responses and the effectiveness of different stress management strategies, promoting a more analytical approach to dealing with stress. The lesson also emphasised the importance of having reliable support systems, such as trusted adults, friends, and school resources, making students realise the value of seeking help and discussing their stressors.

Understanding the need for preparedness was another key idea, as students learned the significance of having plans and strategies in place for unexpected stressful situations. The discussion of various stress management strategies raised awareness of diverse coping mechanisms, enabling students to choose and apply the most suitable strategies for themselves. Furthermore, the lesson improved communication and collaboration among students, as working together to solve problems and sharing experiences and emotions helped build a sense of community and mutual support. Overall, the students benefited from the lesson by gaining a valuable understanding of stress management, improving their practical skills, and recognizing the importance of support systems and preparedness in handling stress effectively.

Lesson 2.

In the geography lesson conducted with the same class on the topic "The Impact of Climate on Human Life and Agriculture," the objective was set to "determine the harm to human health and agriculture." This objective included local climatic phenomena such as icy conditions, frost, dust storms, and hail. To understand students' actions in these situations, a situational task was developed, linked to events that occurred in their local area. For example, a video was shown of a severe dust storm that occurred in Almaty on July 23, 2023. This storm caused several accidents and damages. The video was designed to immerse students in a situational context and develop their practical skills.

To understand the students' reactions to this disaster, they were asked, "What was your reaction to this incident?" The students responded differently. Since the disaster occurred during the summer, many were not in the city, leading to a variety of perspectives.

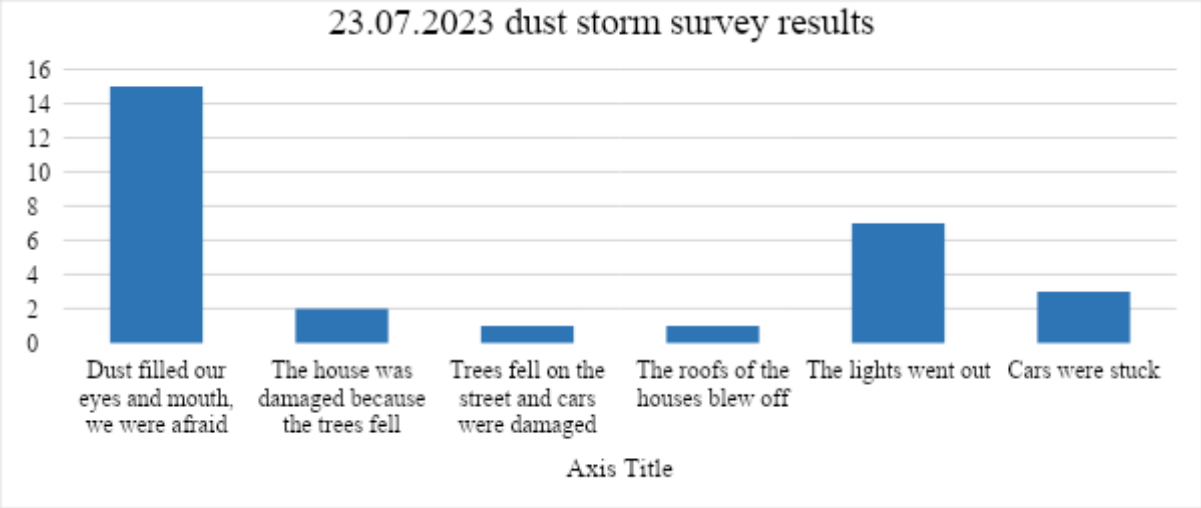

Figure 2. *Students' Reactions During the Dust Storm in Almaty on July 23, 2023*

Some students reported feeling fear when the house roof was lifted and the lights went out, while others understood the adverse health effects of falling trees and the entry of dust and small stones into their eyes and mouths. When we compared their reactions to this incident with their actions during a similar event on March 28, 2024, when another dust storm occurred in Almaty, we saw some differences. In the second situation, they experienced the disaster firsthand. We asked them to recall the dust storm shown in the previous lesson and conduct a comparative analysis. The question posed was: "What were your actions during this disaster?"

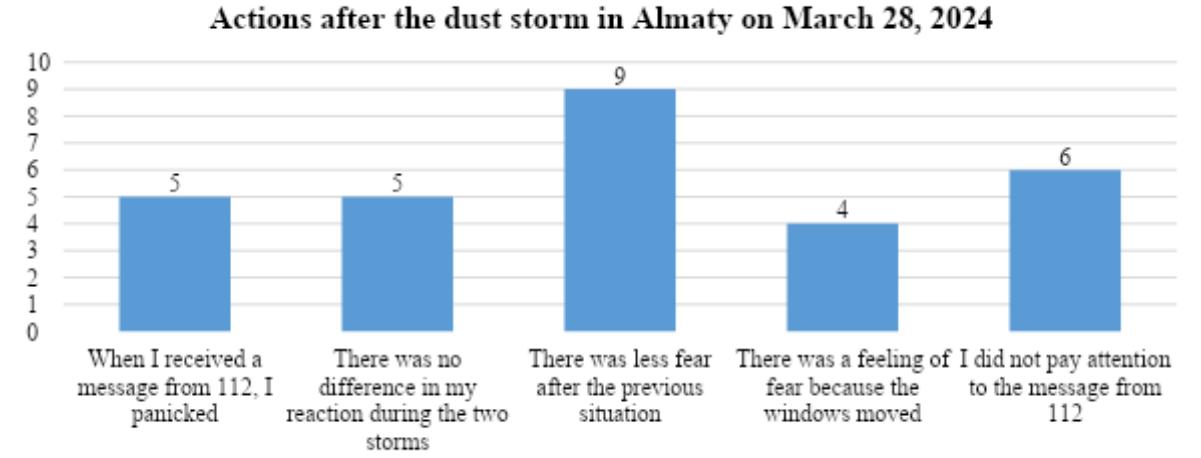

Figure 3. *Students' Actions During the Dust Storm in Almaty on March 28, 2023*

During this disaster, 5 students reported that they panicked and became anxious when they received an alert from 112 (the phone number of the Unified Duty Dispatch Service of the Department of Emergency Situations). 9 students felt less fear compared to the previous incident, while four could not hide their fear when the house windows started shaking. However, 6 students ignored the alerts from 112 and were indifferent to the impending disaster. This behaviour indicated that the students still did not fully grasp the severity of the disaster and were not yet ready to take responsibility for their safety.

To conduct a comparative analysis of these two incidents, we asked the students to discuss in groups what actions should be taken during such an event and to propose measures to prevent disaster-related harm.

The students' suggestions and decisions were to always check the 112 alerts to be informed about an approaching dust storm in advance. They also added to close windows and doors when a dust storm is approaching. If a person is inside a building, ensure that the electricity is turned off. If a person is outside, stay away from dangerous areas such as trees, power lines, and buildings. If the electricity on, the dust storm may damage the power lines, causing people to be injured or even killed. Additionally, students suggested that even if the windows are closed, not leave them unattended because dust can still enter through the edges.

Despite the varied reactions to the disaster, it is evident that the students are prepared to take protective measures and make decisions during an emergency. In class, they examined the causes and impacts of natural disasters and conducted analysis work. Their efforts are demonstrated in the poster they created, which explains how a dust storm occurs: "A dust storm is the transportation of soil or sand by wind in desert, semi-desert, and ploughed areas that occurs during strong winds in dry weather." This is particularly relevant as our region encompasses desert and semi-desert zones.

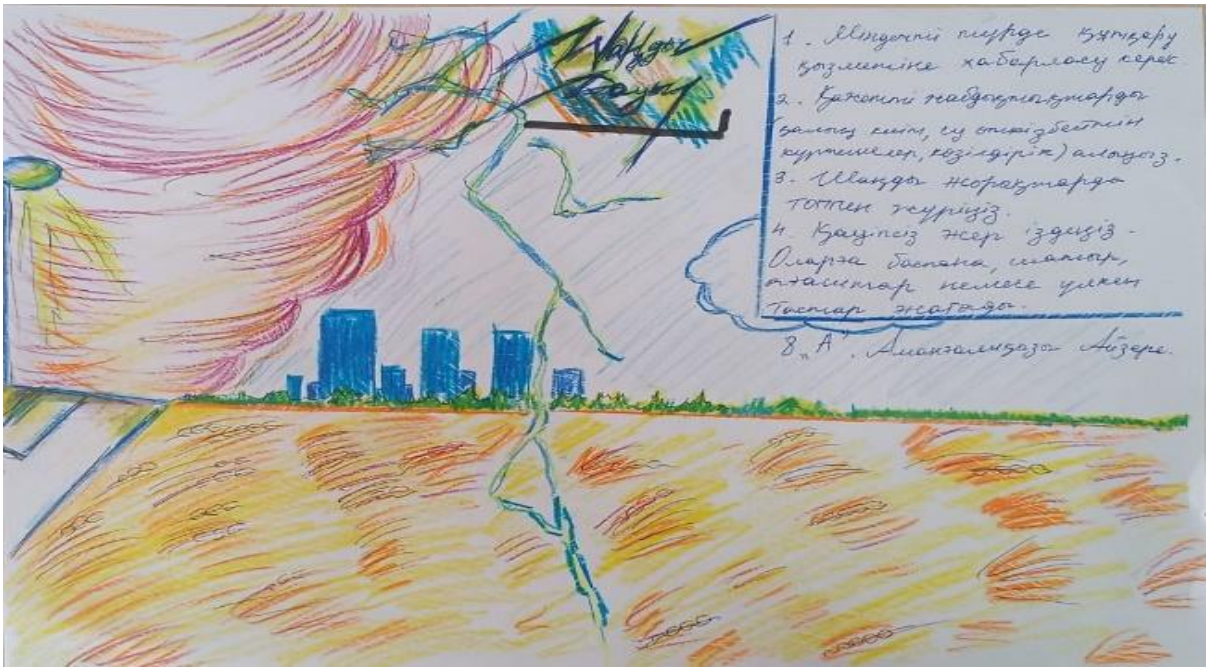

Figure 4. *Students' Actions During the Dust Storm*

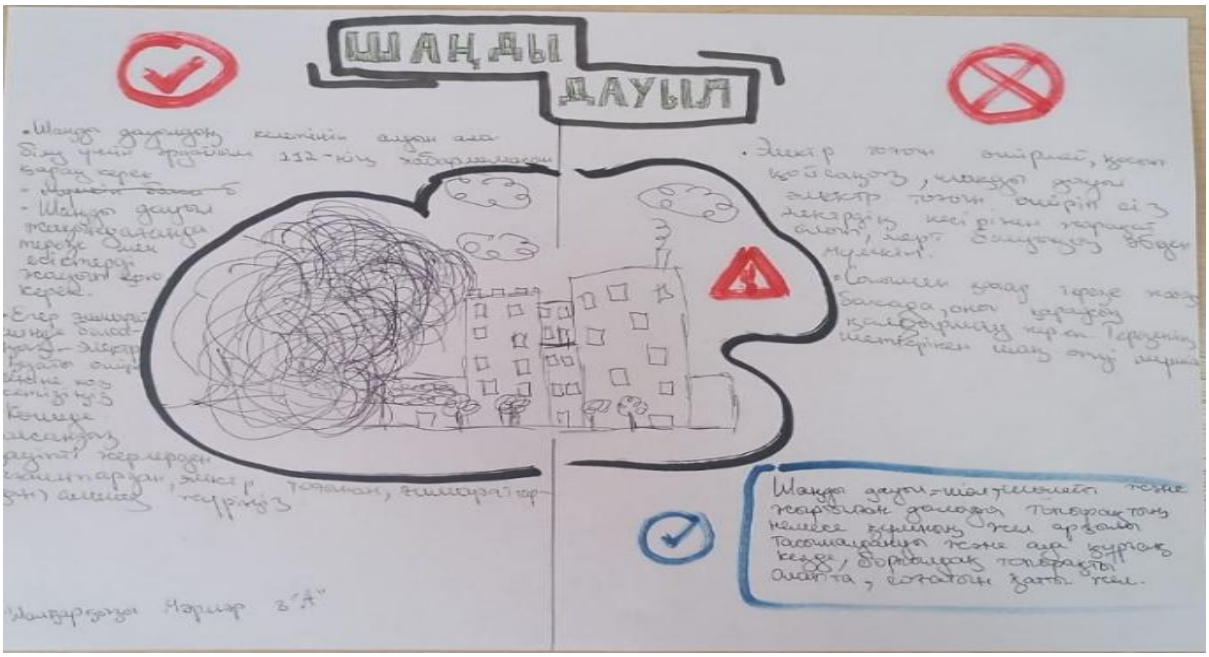

Figure 5. *Students' Decisions and Suggestions During the Dust Storm*

Lesson 3.

For those who enjoy spending their holidays at the sea or ocean, it is important to be aware of the dangers that may not be present in our local area. Therefore, the 8th-grade curriculum includes the topic "Life in the Ocean," which aims to educate students about "dangerous phenomena and situations in the ocean," including tsunamis and attacks by dangerous marine animals. As part of this topic, an assignment introduces information about a shark attack on a person at a beach in Egypt.


Figure 6. *Shark Attack on a Man at a Beach in Egypt*

Although students have not encountered such dangers directly, they understand the severe risk involved. While some students rated the danger as very high, the majority did not consider it extremely hazardous but were still able to identify appropriate protective measures.

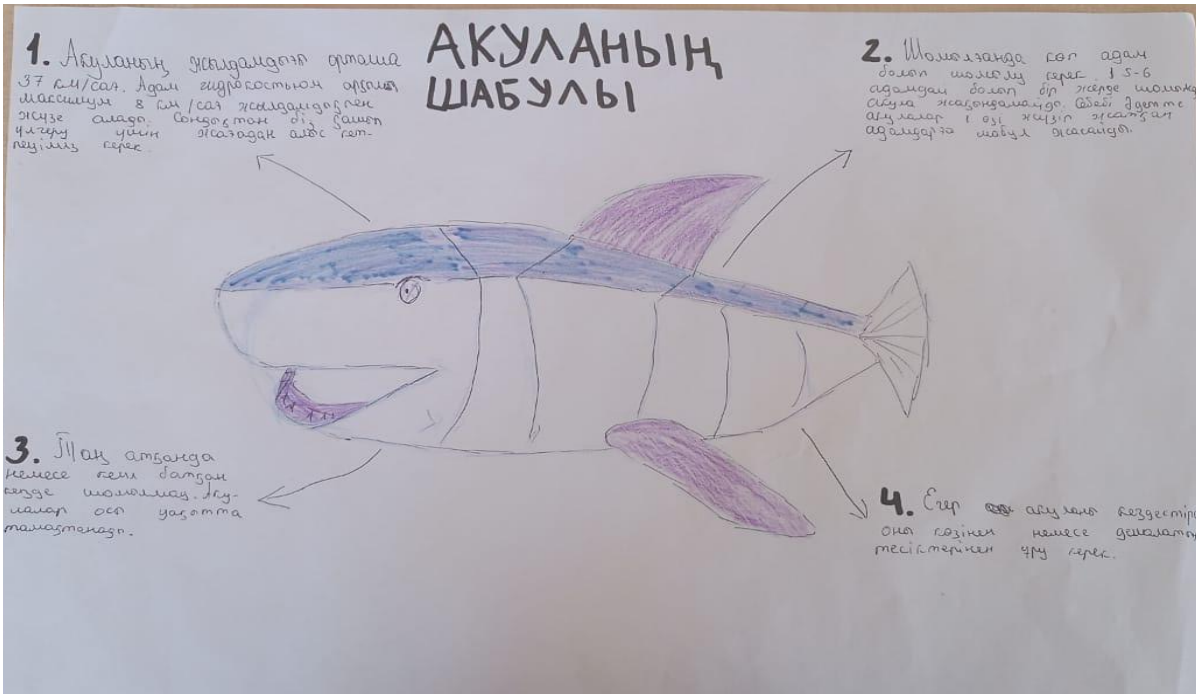

Figure 7. *Students' Decisions and Suggestions During Sea or Ocean Hazards*

Information from the picture:

1. The average speed of a shark is 37 km/h, while a person can swim at a maximum speed of 8 km/h with a wetsuit. Therefore, to escape in time, we should not venture far from the shore.
2. Swim in groups. Sharks are less likely to approach large groups of people and are more likely to attack a solitary swimmer.
3. Avoid swimming at dawn and dusk, as this is when sharks are feeding.
4. If a shark attacks, aim for its eyes or gills.

While completing these tasks, it became evident that students developed their analytical, evaluative, and critical thinking skills in addressing safety issues.

Before starting this study, an entry survey was conducted with the students. The survey included the question, "What dangers have you encountered in your life?" and the following responses were obtained.

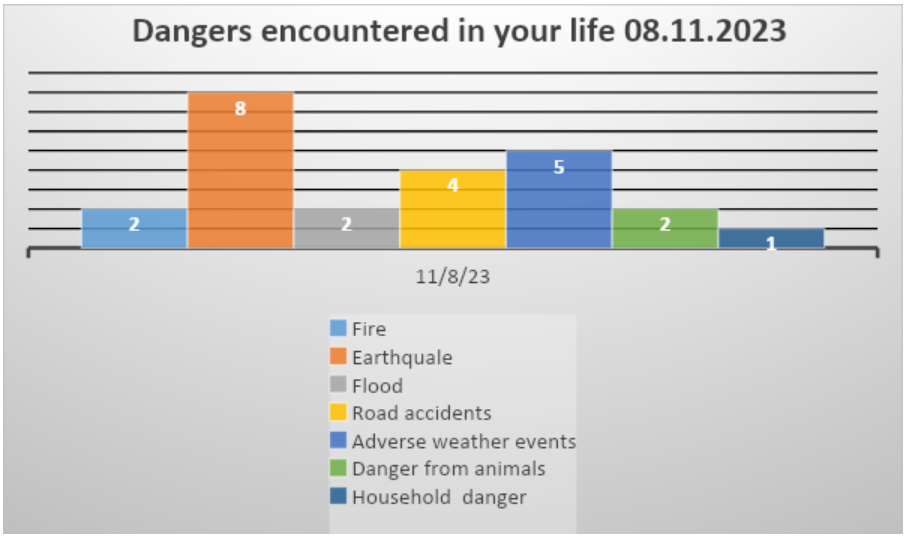

Figure 8. *Entry Survey: Dangers Encountered by Students in Their Lives*

Most students are aware that their local area is situated in a seismic zone, as each parallel class covered the topic of the "Lithosphere." However, they also mentioned medium-level risks such as floods, fires, adverse weather conditions, animal hazards (e.g., dog bites), and household dangers. Despite this, it remains unclear to what extent they understand the significance of these hazards.

Currently, there are many sources of information in society, including forecasters, bloggers, clairvoyants, and numerologists. In early January 2024, entrepreneur and blogger Alexander Savelyev disseminated information about an impending earthquake in Almaty. To determine the students' reactions to this information, we conducted a survey.

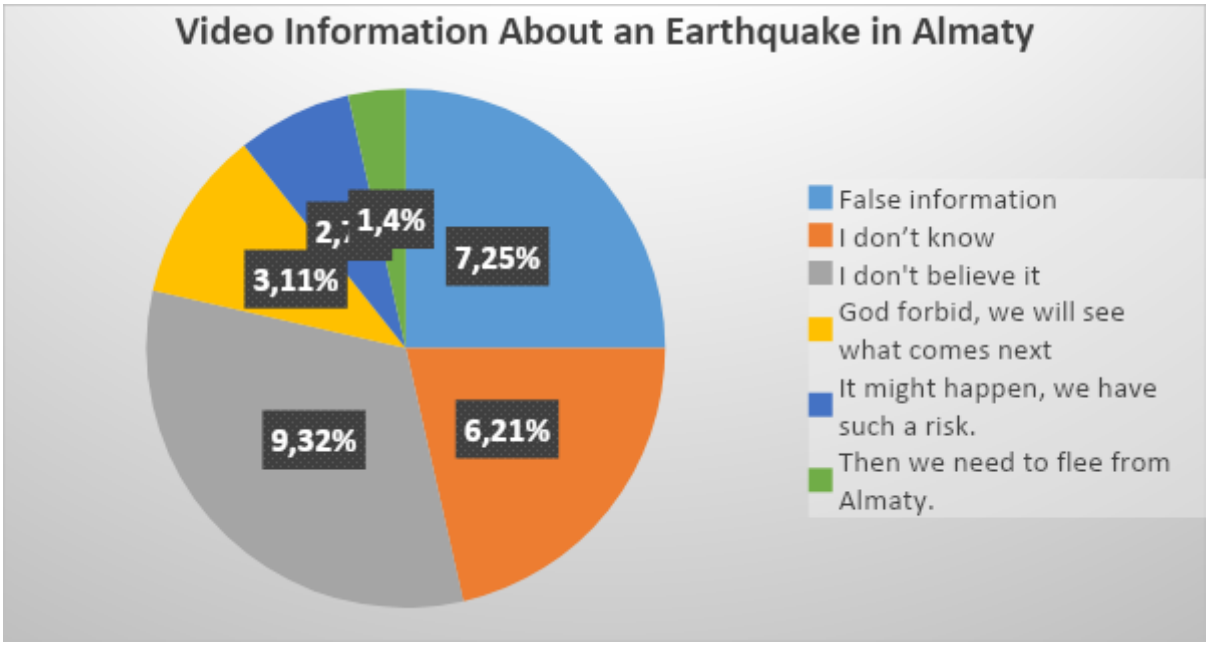

Figure 9. *Students' responses to the information about an earthquake in Almaty*

As it is evident, in the previous survey, despite knowing that their local area is located in a seismic zone and prone to earthquakes, the responses indicating disbelief and false

information increased, while responses such as "I don't know" and "God forbid" beliefs were still present.

However, on January 23, 2024, at 00:09 Astana time, seismic stations across Kazakhstan recorded the most severe earthquake. All stations of the National Nuclear Centre of the Republic of Kazakhstan's monitoring network documented this event.

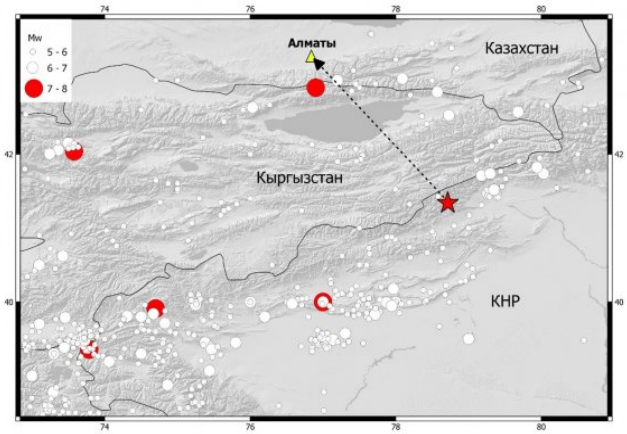

Figure 10. *Earthquake in Almaty on January 23, 2024, at 00:09 Am, Lasting 2 Minutes With a Magnitude of 5.*

This disaster was also felt in Almaty city, Almaty region, Zhambyl region, and Turkestan region. The epicentre was located at the border between Kyrgyzstan and China, where the earthquake had a magnitude of 6, while in Kazakhstan, it registered as a magnitude of 5. Historically, one of the most devastating earthquakes in Kazakhstan occurred at the end of the 19th century and the beginning of the 20th century, on January 4, 1911, at 4:25 AM, with a magnitude of 10-11 (8.2 magnitude). This earthquake is considered the strongest in Central Asia, destroying 736 brick buildings in Verny (now Almaty), killing around 50 people, and injuring over a hundred.

Approximately two weeks after the blogger's prediction, the earthquake struck. During the earthquake, many people panicked and became very frightened. People rushed out of their homes and tried to flee to the outskirts of the city. Although they received alerts from 112, these messages were often ignored. Those who couldn't escape were taken to safe points (schools and kindergarten buildings). The seismic drills conducted in the city and educational institutions did not prove effective. No alarms took place. This event highlighted the low level of preparedness and response to natural disasters in our country. Following this disaster, the survey conducted among the students showed real results.

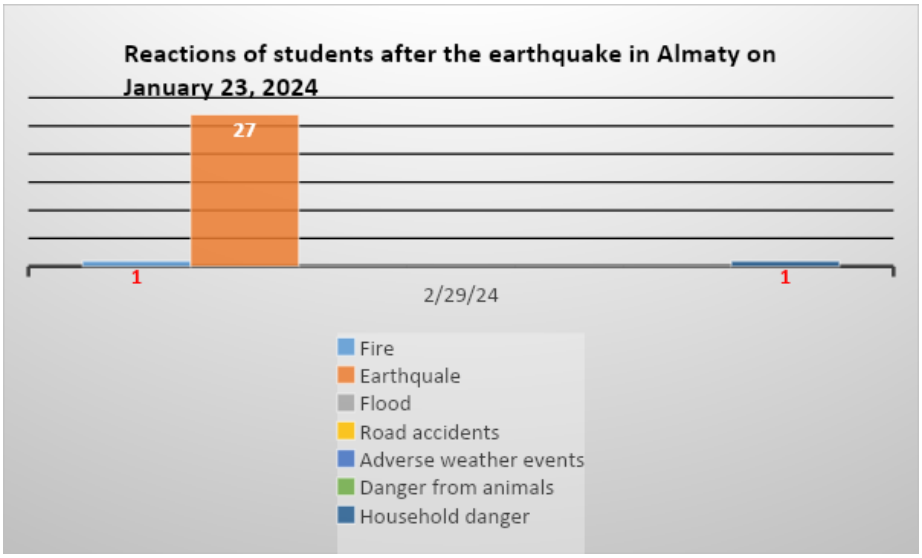

Figure 11. *Students' Reactions After the Earthquake in Almaty on January 23, 2024*

Compared to the November survey, an overwhelming majority of the 29 students (27) indicated experiencing the earthquake. The influence of the January 23, 2024, earthquake is evident. The number of respondents taking action increased significantly compared to the first survey. Only one student was asleep and unaware, and one was surprised, while the rest took various actions independently or with their families: they went outside or acted based on the warnings. Notably, three families had prepared emergency kits in advance. The number of students who remained calm also increased. The impact of the drills and the information provided during lessons at school is evident among the students.

During this time, everyone at the school reacted differently to the disaster, with some panicking and running outside. After the incident, to understand the actions of the students and school staff, we asked the following question: "What was your reaction during the earthquake on March 4?"

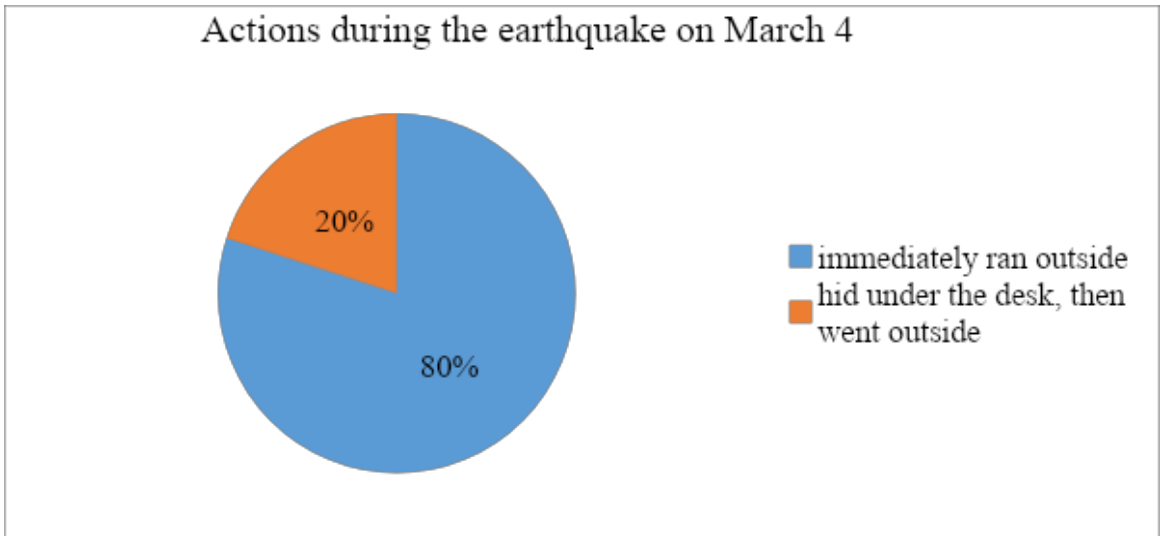

Figure 12. *Actions of People at the School During the Earthquake in Almaty on March 4, 2024*

80% of the people at the school immediately ran outside, while 20% hid under desks and then went outside. This data suggests that, because the disaster occurred unexpectedly, people were unable to remain calm when making decisions. Unlike in Japan, such phenomena do not occur frequently in Kazakhstan. The next question posed to the 8th grade students was: "Which actions are correct during an earthquake?"

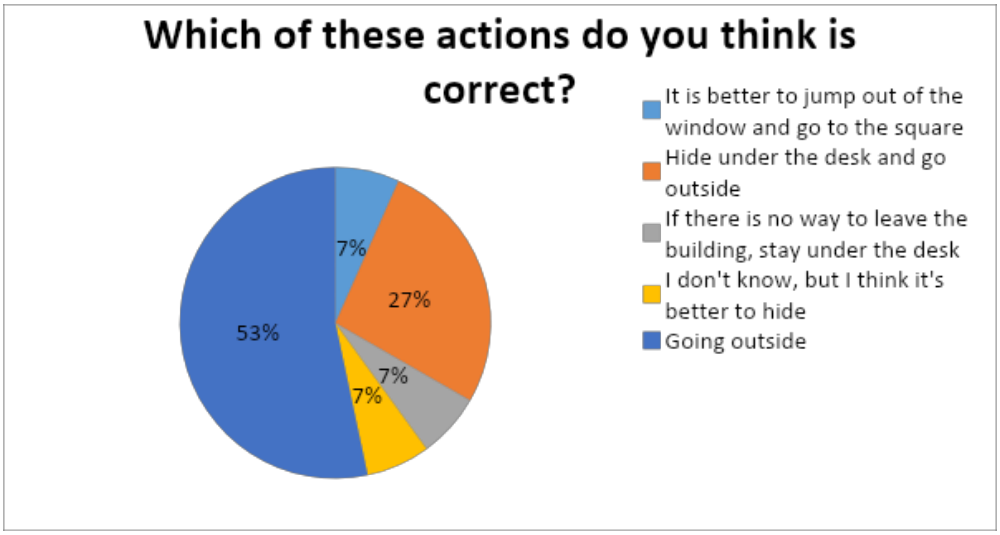

Figure 13. *Indicators of Actions During the Earthquake*

The majority of students determined that going outside was the correct action among the various responses. However, it was noted that they did not pay much attention to the instructions and guidelines posted in each classroom.

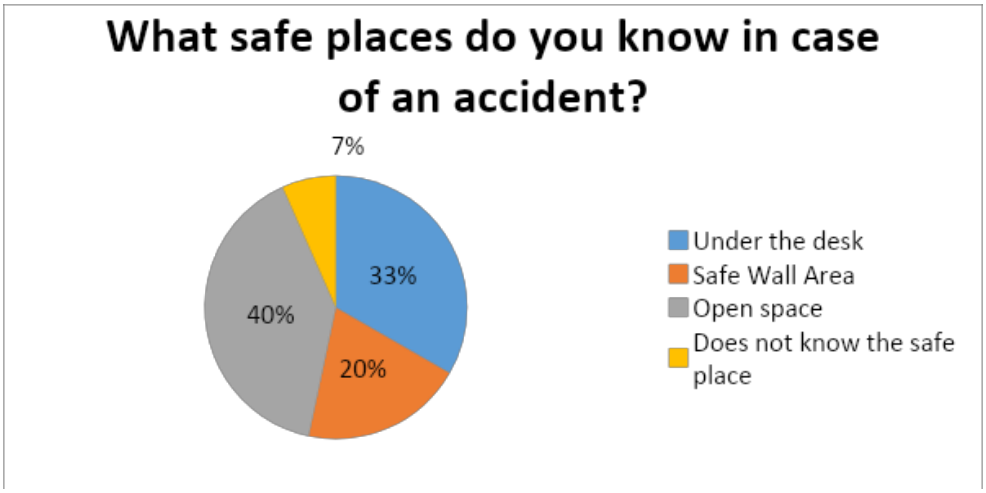

Figure 14. *Information on Safe Areas During an Earthquake*

In response to the question "What safe areas do you know of during a disaster?" most students indicated that they paid attention to the warnings given during lessons and drills.

Results

Based on the research, we reached the conclusion that students' awareness of situations that threaten human life safety has significantly increased, as evidenced by the exit survey data and the outcomes of the situational tasks. The results of the study indicate the need for the school community to rethink its approach to preventive and training activities. Additionally,

students demonstrated critical thinking skills while performing situational tasks and produced outputs from their mini-research projects in the form of posters, guidelines, and presentations.

Conclusions

Our research is important for several reasons. At a mental level, it helps students develop a conscious understanding of situations that threaten human safety. On a practical level, modelling situational tasks aids in developing students' response skills to life-threatening situations. This approach also promotes a sense of responsibility among students for their own lives and the lives of those around them. The results of the entry and exit surveys confirm the relevance of our study.

Thus, based on the conducted research, we concluded that the application of situational task modelling in educational practice shows significant positive results in developing students' safe behaviour skills. This method allows for the integration of theoretical knowledge with practical skills, leading to better material retention and increased readiness of students for real-life situations.

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Contact email: Damirovas202@gmail.com