

# GENERAL CONCEPT OF EDUCATIONAL PROGRAMS FOR STUDENTS' DISASTER RESPONSE

**Silvia Marinova, Kristina Kehayova**

Assist. Prof. Dr. Eng. Silvia Marinova  
University of Architecture, Civil Engineering and Geodesy  
1, Chr. Smirnenski Blvd.  
1046 Sofia, Bulgaria  
Tel. +359 888 244348  
E-mail: silveto\_marinova@yahoo.com  
Web site: www.uacg.bg; www.cartography-gis.com

Kristina Kehayova  
University of Architecture, Civil Engineering and Geodesy  
1, Chr. Smirnenski Blvd.  
1046 Sofia, Bulgaria  
Tel. +359 883 603075  
E-mail: kristina\_christ@abv.bg

## **Abstract**

*Each year millions of people are affected by various disasters that cause many casualties and considerable damages. Children are one of the most vulnerable groups of population in case of a disaster situation. Many organizations are focused on the improvement of children's disaster preparedness and response and provide useful and adapted information about disasters. Children awareness can be upgraded by including this information in the curriculum of primary and secondary schools and applying effective and modern training methods. This paper aims to present the conceptual framework of educational programs for disaster response of students at primary and secondary schools. The programs are consistent with the educational stage of the students and include introduction to various types of disasters and disaster preparedness and response trainings. The paper presents the general concept of the educational materials and activities. Particular attention is paid to students' training how to use topographic and thematic maps.*

**Keywords:** educational program, disaster preparedness, disaster response

## **INTRODUCTION**

Being prepared for natural and man-made disasters is one of the greatest challenges for the Earth population. Disasters take millions of victims every year. Therefore training of the population, even in early childhood, on topics related to awareness, preparedness and protection in case of disasters is the key tool of building sustainable theoretical and practical knowledge to provide response in crisis situations. In this paper a general concept of educational programs for students' disaster response is described. The programs are planned to be supported by educational activities and materials such as books, brochures, posters, games and simulations that could develop children's skills of disaster response.

## **EDUCATIONAL SYSTEM IN BULGARIA**

Education in Bulgaria is compulsory until the age of 16 (Figure 1). The school year in the country is divided into two terms: winter term from Mid-September to the end of January, and summer term – from the beginning of February to June. At the end of each term students receive term grades in each subject and at the end of the school year they get final grades (DYNOT, 2016).

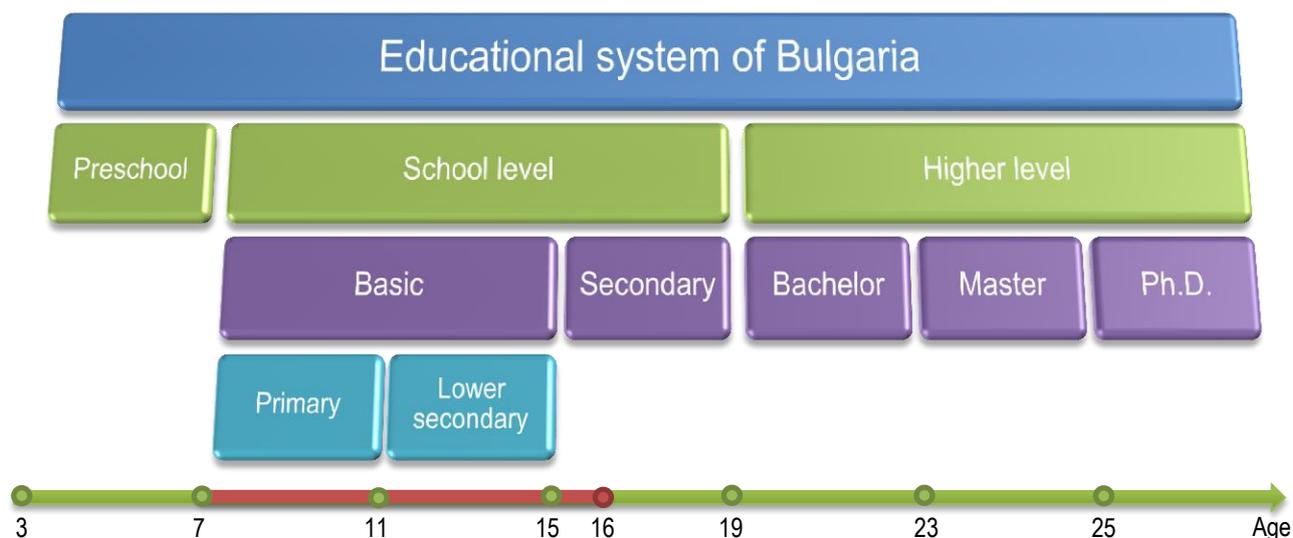


Figure 33. General stages of the education in Bulgaria. Red line symbolizes years of compulsory education

**Preschool education** (ISCED'11, Level 0) is for children between 3 to 6/7 years-old. Visit of kindergarten is not mandatory. Although state kindergartens prevail, there are also private kindergartens and their number is growing in recent years.

**Basic education** continues from age 7 to 15 in grades 1 through 8. It comprises of *primary schools* (grades 1-4, ISCED'11, level 1) and *lower-secondary schools* (grades 5-8, ISCED'11, level 2). Primary education can be obtained at state, municipal or private schools. At the end of grades 4, 7 and 8 external evaluation in test format is carried out in schools where students show their level of knowledge gained during their studies. Certificate of Primary Education is issued to students who have successfully completed the 8th grade.

**Secondary education** (ISCED'11, level 3) can be divided into comprehensive (general) secondary schools, specialized schools and vocational-technical schools. Admission to the specialized schools is carried out after completion of 7 or 8th grade and after taking the exams depending on the profile of the school (exams in Bulgarian language and literature, mathematics, etc.).

**Higher education** (ISCED'11, levels 6,7,8) is for the students who have chosen to continue their studies and who have successfully passed the high school exit exams and the specific exams of the university in the chosen profile.

Table 8. Specificities of the basic education in Bulgaria

Country	Primary education level					Lower secondary education level				
	Grade		Age		Total years	Grade		Age		Total years
	From	To	From	To		From	To	From	To	
<b>Bulgaria</b>	1	4	7	11	4	5	8	11	15	4
Description	Subjects include literature, grammar, mathematics, music, art, physical education, social and environmental studies, foreign languages and technologies. Most of the subjects are held by the head teacher of the class. A special class with the head teacher is held once a week. Most primary schools offer an after-school program, which is a basic supervised childcare with no teaching.					Adding biology, geography, history, physics, chemistry, informatics and philosophy to the curriculum.				

Focus of the topic is the Basic education and the Secondary education. The Basic education in Bulgaria comprises of two study levels: Primary and Lower secondary level. Table 1 shows some general and specific elements of the Basic education. For the academic 2015/2016 year there are 262 000 students in primary education (grades 1 - 4) and 216 400 students in lower secondary education (grades 5 - 8) in Bulgaria.

## **ANALYSIS OF AVAILABLE EDUCATIONAL MATERIALS**

### **Background**

The theme of disaster protection training in the public educational system in Bulgaria is legally justified by the Disaster Management Act (2006), which states that the education system must include regular tuition on disaster protection and first aid. On the other hand, the national Bulgarian policy for risk reduction and disaster protection is dictated by:

- The UN Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters;
- National Strategy for Disaster Risk Reduction 2014-2020;
- National plan for Disaster Protection 2014-2018.

One of the priorities of the National Strategy for Disaster risk reduction is building a culture of disaster protection through the use of education and training (Council of Ministers, 2014).

### **Initiatives Regarding Disaster Awareness Education in Bulgaria**

In the period 2005-2009 Bulgaria held a policy in the field of prevention, response, and crisis management in the face of the former Ministry of Emergency Situations (MES). It brought together different departments in these areas. Moreover, the National Service "Civil Protection" was directly subordinate to the Ministry. The Training Center, part of MES, was focused on prevention work and training students on disaster protection. Different extracurricular activities were organized by the Training Center. A very successful initiative was the drawing competition "Mission: Rescuer", held in different age groups on regional and national level. Another student competition held on municipal, regional and national level was focused on "Safety in Emergency situations" – it required theoretical and practical knowledge gained at class. Another initiative was a website, developed to help teachers and students regarding disaster protection education. The website's children section was intended to contain diverse interactive materials, such as flash games, which would have helped in developing students' basic disaster awareness skills. Most of these initiatives held by the former MES are now cancelled. Due to structural changes MES is not operating since 2009.

In 2011, four European countries – Greece, France, Italy and Bulgaria, start a project co-funded by the EU as a part of the program "Civil Protection 2010". The project called RACCE (2011) (Raising earthquake Awareness and Coping Childrens' Emotions) is coordinated by the Natural History Museum of Crete, Greece. RACCE is addressed to children. The project is mainly focused on raising awareness and improving knowledge on earthquakes. The Bulgarian representative and project implementer is the Center for Educational Initiatives (CEI). As a result of the initiative, many posters and an Educational Kit "Earthquakes and Volcanoes" for children were produced. All of these educational materials are in English with examples from the participating countries. Only some posters, the Theoretical Handbook and Activities' Guide (designed for ages of 6-13), which are part of the Educational Kit, can be found in Bulgarian language on the Bulgarian section of the project: <http://racce.nhmc.uoc.gr/bg/downloads/vivlia/vivl.html>.

The Bulgarian Red Cross (BRC) is also contributing to the training and education on disaster protection of the population. Useful advices for response in case of disaster can be found on their webpage: [http://www.redcross.bg/advice/disaster\\_advice.html](http://www.redcross.bg/advice/disaster_advice.html) (Bulgarian Red Cross, 2016). In 2011 BRC initiates the project "Youth Prevention Pro", which involves 3 European countries – Greece, France and Bulgaria. The project is realized with the contribution of the Civil Protection Financial Instrument of the European Union. It aims at raising children's awareness on civil security risks which would result in societal resilience to major crises. The goal is to synchronize and adapt the best practices to each country's system on disaster prevention education by putting together three European countries with different methodologies and experience. As a result of this initiative, a school prevention program is created: "School program: Reducing the risk of disasters, accidents and terrorist acts and teaching first aid among students aged 10-14 years". It reflects the policy of the European Commission for Prevention and the national requirements of the partner countries. A textbook for educators and an educational DVD, based on the school program, are also produced (YouthPreventionPro, 2016). The handbook named "Textbook for application of school prevention program" from 2011 gives basic information on natural and man-made disasters and focuses on the correct behavior of children and students during fires, floods or earthquakes.

In 2015, interdepartmental working group develops and provides for public consultation the Project "Instructions for training on disaster protection and for providing first aid in the public educational system" (2015). The project stands as part of the implementation of the measures adopted in the National Strategy for DRR 2014-2020. According to the project preparation of the students on disaster protection is mandatory for all kindergartens and schools. It is proposed that the program should be conducted by the possibilities of the school curriculum for elementary, lower-secondary and secondary education, as well as practical classes with students of all grades should be conducted at least once a year. The project suggests specific topics for each grade from I to XII, including 5 classes with a total duration of 5 hours.

The Bulgarian Fire Safety and Civil Protection Directorate General is part of different educational initiatives. The Directorate is responsible for the creation of the movement Youth fire brigade (MFB) "Young firefighter" in Bulgaria where children on a voluntary basis between 12 and 16 years old may be involved. The main objective of the youth movement is to increase the physical ability of young people, develop practical skills such as lifesaving actions during fires, natural disasters and accidents. The Directorate administrates an informational website where results from diverse projects can be found. Some of the past and on-going activities are: "Youth stronger than fire" and "Safe Quake" projects from 2011, the drawing contests "Mission: Rescuer" and the international "I saw disaster with my eyes". The Directorate General also organizes national competitions for young firefighters and rescuers (Fire Safety and Civil Protection Directorate, 2016). More information about the activities held for children can be found at: [http://pojarna.com/bg/sections/rabota\\_s\\_deca/](http://pojarna.com/bg/sections/rabota_s_deca/).

The Fire Safety and Civil Protection Directorate General is the Bulgarian representative in another recent and on-going initiative with international cooperation – the project FORETELL (2016): Flood and Fire Safety Awareness in Virtual World (funded by Erasmus+ Programme of the European Union). It emerges from the need to promote a culture of safety in Europe against natural calamities, such as floods and fires. The aim is to prepare children to cope with these environmental hazards, through experiential learning activities (simulations or/and educational games) which will be implemented in a 3D virtual environment. At this moment a questionnaire, including in Bulgarian, is prepared for students in primary and secondary education level and their teachers. The results of the questions shall define the vision of the target groups regarding the use of 3D simulation games in the learning process. It shall also define the children's level of preparedness in case of fires and floods. The questionnaire can be accessed through the project webpage: <http://foretell.eap.gr/index.php/news/15-questionnaire-2>.

### Analysis of Educational Materials

For the purpose of the Bulgarian information campaigns for disaster protection flyers, brochures, booklets and other materials are prepared aimed at preschool and educational institutions, such as coloring books and posters, indicating actions in case of different disaster situations (Council of Ministers, 2013). However, many of these materials are rather aimed at pre-school children (Figure 2).



Figure 34. Educational materials for children in preschool and 1st grade in Bulgaria

The above mentioned RACCE project in which Bulgaria took part resulted in the creation of educational materials regarding disaster preparedness, mainly by promoting knowledge on earthquakes, volcanoes and tsunamis. The educational materials on the project consist of:

- 20 posters in English from which 10 translated to Bulgarian (Free access at: <http://racce.nhmc.uoc.gr/en/downloads/posters/posters.html> – English version, <http://racce.nhmc.uoc.gr/bg/downloads/posters/posters.html> – Bulgarian version);

- Educational Kit “Earthquakes and Volcanoes” with full English version consists of: Books; Activities; Video; Presentations; Case Studies; Evaluation; Children with special needs.

The Bulgarian version of the Educational Kit “Earthquakes and Volcanoes” which can be freely accessed at the Bulgarian section of the project contains the Theoretical Handbook and the Activities’ Guide (designed for ages of 6-13). The educational materials in Bulgarian present the same information as those in English. However, the design of the Theoretical handbook is far different and not so attractive for the target group – it only presents raw information with almost no pictures, images, graphs, maps etc. (Figure 3).

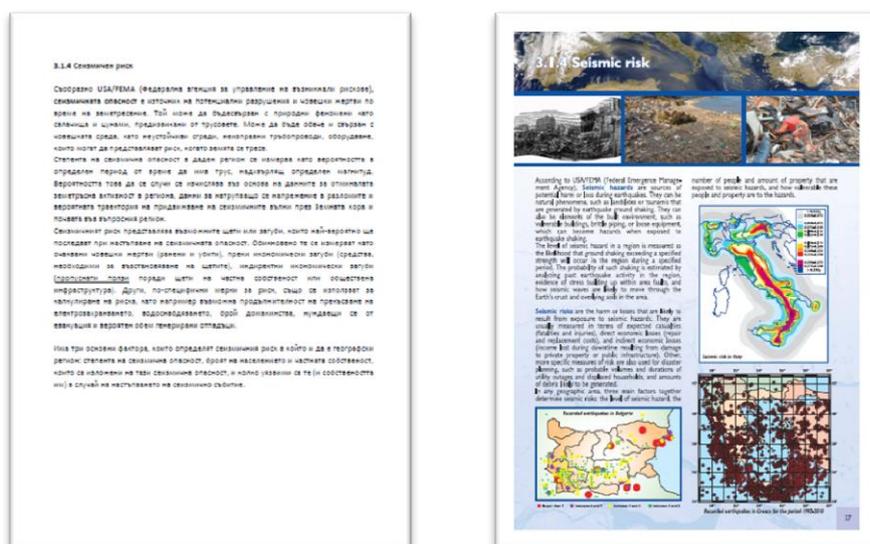


Figure 35. Comparison of the design between same pages of the Bulgarian (on the left) and English version (on the right) of the Theoretical Handbook "Earthquakes and Volcanoes" created on the project RACCE

However, the Bulgarian posters have an attractive design and useful information on the topic. Another point of discussion is to what extent the content of these materials is adapted for children and for exactly which age group. On the one hand, all the graphics are accompanied by explanatory inscriptions from the original version in English. This in no way can be considered acceptable and adapted for Bulgarian children. On the other hand, the content consists of many terms that would be considered difficult for the youngest in the target group of 6-13 years old. There is no information if the materials have actually been tested for completeness, understanding and educational value among students in Bulgaria.

The website of the Fire Safety and Civil Protection Directorate General of Bulgaria is a useful tool for finding appropriate information for children’s disaster protection. It contains specialized section “Working with children” where some educational materials regarding mainly fire safety can be found. A “Fire safety guidebook for children” is created as part of the project “Youth stronger than fire”, realized with the financial support of the "Youth in Action" project of the European Commission. It is a very useful educational material with a really nice design, representing an educational guide on fire safety for the implementation of year-round training of the youth fire brigade "Young firefighter" in which children between 12 and 16 years old may take part. The material is created by experts and successfully adapted to the target group. The attractive design is achieved through the use of color images, informative graphics, section "Did you know...", educational messages in rhyme format. On the website a list "Backpack for disasters" and "Family Action Plan in case of disaster" can be found. The Directorate has also published a brochure aimed at children called "Stop forest fires" containing information on the causes, consequences and life-saving actions in case of forest fires (Figure 4).



Figure 4. "Stop forest fires" informational brochure for children

The concept of teachers' preparation on how to teach children on disaster response is most common in Bulgaria. During the existence of the Ministry of Emergency Situations, teacher guidebooks have been produced with the financial support of the United Nations Development Program (UNDP) / Bureau on prevention and crisis recovery (BCPR) in the project "Prevention of disasters and accidents through the secondary Education in Bulgaria", implemented in partnership with the former Ministry of Emergency Situations, Ministry of Education and Science and UNDP. These teachers' books consist of methodological developments for training children in school on disaster protection. There are 3 teacher books, one for every stage of the school education:

- Elementary level;
- Lower-secondary level;
- Upper-secondary level.

Each teacher guidebook is freely available in digital format on the website of the publisher but no information is found on the current existence in paper format and actual use of these guidebooks.

According to a recent report on the implementation of the Hyogo Framework for Action from 2015, disaster protection education as well as education on first aid is carried out in school in compliance with programs approved by the Minister of Education and Science. The education model is based on modern methodology using interactive forms, methods and means. For children at secondary school educational level boards and posters are created. Out-of-school training activities for disaster protection are also carried out (Chief Directorate Fire Safety and Civil Protection, 2015). The report says nothing on the development and implementation in school curriculum of educational materials for children in primary education in Bulgaria.

## Role of Cartography in the EW&CM Education in Bulgaria

### Overview

Cartography provides one of the most powerful tools for spreading important information and for visualization of different phenomenon, such as natural disasters. Moreover, a better understanding about natural disasters can be achieved among children by the help of different interactive mapping techniques. Thus, the inclusion of appropriate cartographic materials and information about disasters in the school curriculum can significantly help in building a culture of safety and nations' resilience to natural disasters.

In Europe, member states are in the process of developing a number of initiatives related to mapping hazards or risks. However, these initiatives are not focused on mapping hazards for children, but for professional purposes. The role of cartography for children purposes on disaster preparation is unfortunately underestimated in countries such as Bulgaria.

### Cartographic Materials in Bulgaria

In recent years different surveys have been conducted in Bulgaria regarding children's understanding on maps and EW & CM. Focus of the researches is cartography and its base product – the maps, as a tool with diverse visualization and informative functions. The basic map skills studies include topics such as children's understanding on object presentation on maps (Bandrova & Deleva, 1998), students' knowledge on maps. Another researches on a subject

related to EW & CM were also conducted: creating and updating navigation maps for children purposes in crisis situations which focuses on the symbol and color system for children needs (Bandrova & Vasilev, 2008); how cartographers can help children and students in disaster situations to make their lives safer and minimise damage using maps (Bandrova et al, 2010). Another similar project makes a proposal of a cartographic symbol system for children on EW & CM, tests primary children's understanding on maps for EW & CM and also kids' map reading skills (Bandrova & Milanova, 2011).

One of the major conclusions of these Bulgarian studies shows a great need of attractively presented books, guides and information materials for children in different age groups on the topic of EW & CM (Bandrova et al, 2010). Such studies are just part of a greater concept, regarding a proposal of a national and international education programs which adopt good practices from around the world.

## GENERAL CONCEPT OF EDUCATIONAL PROGRAMS

Most of the existing programs and materials in Bulgaria are focused on floods, earthquakes and fires. However, students should be prepared to respond to various natural and anthropogenic phenomena and to develop skills in teamwork and problem solving.

Best practices and methodologies for students' disaster response shows that the existing Bulgarian educational programs for disaster preparedness and response should be supplemented. The programs should become more attractive to the students and suitable to their educational level and age group. The paper proposes general concept of educational program for disaster response categorized in three main levels according to the students' educational level:

- Level 1 - Primary education - Age 7 – 11;
- Level 2 - Lower-secondary education - Age 11 – 15;
- Level 3 - Secondary education - Age 15 – 18.

The program for each educational level consists of lectures and trainings of four main modules: **"Types of disasters"**, **"Disaster Assessment and Preparedness"**, **"Disaster Protection and Response"** and **"First Aid"**.

Module 1 - "Types of Disasters" includes three main themes: Natural disasters (with subthemes: earthquake; flood; hurricane; heavy rain; thunderstorm; snow storm; avalanche; landslides; extremely high temperatures; extremely low temperatures; epidemic); Anthropogenic disasters (with subthemes: nuclear accident; radiation accident; chemical accident; explosion; transport accident; fire, etc.) and Typical disasters for the region.

Module 2 - "Disaster Assessment and Preparedness" includes topics such as General concept; Disaster risk reduction; Use of disaster symbol systems; Map use for disaster preparedness and Designing family disaster plan.

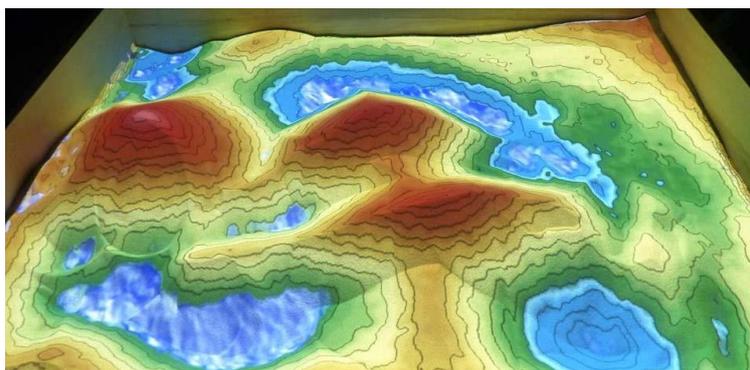
Module 3 - "Disaster Protection and Response" includes the following themes: General concept; Planning the activities in case of disasters; Emergency provision kits; Map use for disaster prevention and response; Drawing maps for disaster response; Trainings based on simulation models and scenarios.

Module 4 - "First aid" includes topics such as Actions and rules for first aid; First aid for burning; First aid for hypothermia; First aid for frostbite; First aid for heat stroke; First aid for loss of consciousness; First aid treatment for breathing problems; First aid for poisoning; First aid for wounds; First aid for braking joints.

Each topic is planned to be supported by appropriate for the age group educational activities and materials with attractive design.

The **educational materials** include: books with theoretical information; exercise books; drawings; information posters and brochures; presentations; videos; maps (topographic maps, risk maps, hazard maps, maps based on statistical data, maps for disaster protection planning, rapid maps, evacuation maps, etc.); simulation models (augmented reality sandbox, etc.); questionnaires; educational activities' guide; etc. Disaster preparedness and response are supported by the use of special symbols on graphic materials (thematic maps, brochures, etc.). Many organizations use various symbol systems for the needs of their particular activities. The Symbol System for Disaster Management in Bulgaria proposed in 2014 by Marinova (2014) includes four level hierarchical classifications of objects and phenomena according to their type and origin. The symbols of categories: disasters; infrastructure; protection services and infrastructure for protection; affected people and affected infrastructure; operational sites and activities are shown with different colours and shapes so that they are identifiable, simple, and associative. After some additional psychological analysis of students' thinking this symbol system can be adapted to children and applied in educational materials for disaster preparedness and response. Students' ability to use such symbols would help them to understand thematic maps

better. Students could try to design their own symbols and to draw maps according to their understanding of the disaster situation.



*Figure 5. Augmented Reality Sandbox*

Educational materials are necessary for theoretical knowledge and support **educational activities** such as participation in seminars; educative games for disaster preparedness and response; computer games; trainings with simulation models; evacuation training; simulations based on disaster scenarios, etc. Some of the educational activities can be held in the proposed by Bandrova et al. (2015) Educational Centre “Safe the Children Life”. The Education Centre could provide illustrative simulations of different natural disasters using well-equipped lecture hall, modern digital equipment, augmented reality sandbox (Figure 5), small-sized shaking table, etc.

## CONCLUSION

Children are one of the most vulnerable groups of population in case of a disaster. They need special trainings to be prepared for crisis situations. Students at primary and secondary schools need adapted information about disasters presented by effective and modern training methods. All educational materials and activities should be attractive to the students and suitable to their educational level and age group. The proposed educational programs for students' disaster response aim to teach students what to do and how to act before, during and after a disaster. Students should acquire knowledge and skills for disaster preparedness, response and first aid and to apply them in case of an emergency. To achieve this objective teachers need to work closely with the Educational Disaster Centre.

## REFERENCES

- Bandrova, T., A. Deleva, (1998). Contemporary Cartography for Children in Bulgaria, The Joint Seminar "Maps for Special Users", pp.59-76, Wroclaw, Poland
- Bandrova, T., M. Konecny, M. Rusnakova, (2010). Research of Students' Cartographical Knowledge in Early Warning and Crisis Management. In Geographic Information and Cartography for Risk and Crisis Management. Lecture Notes in Geoinformatics and Cartography. ISSN 1863-2246, ISBN 978-3-642-03441-1 Springer Heidelberg Dordrecht London New York, 2010, pp. 361-378
- Bandrova T., M. Kouteva, L. Pashova, D. Savova, S. Marinova (2015). Conceptual Framework for Educational Disaster Centre “Save the Children Life”. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-3/W3, 2015 ISPRS Geospatial Week 2015, 28 Sep – 03 Oct 2015, La Grande Motte, France. pp. 225-234
- Bandrova, T., S. Vasilev, (2008). Creating and Updating Navigation Maps for Children Purposes (in Crises situations)
- Bandrova, T., Y. Milanova, (2010). Cartographic Application on the Base of Children's Understanding of Early Warning and Crisis Management, USB Proceedings. Publisher: The French Committee of Cartography. 25th International Cartographic Conference, Paris, 3-8 July, 2011, ISBN: 978-1-907075-05-6
- Bulgarian Red Cross. Disaster advice. (n.d.). Retrieved April 26, 2016, from Website of the Bulgarian Red Cross: [http://www.redcross.bg/advice/disaster\\_advice.html](http://www.redcross.bg/advice/disaster_advice.html)
- Chief Directorate Fire Safety and Civil Protection. (2015). National progress report on the implementation of the Hyogo Framework for Action (2013-2015). Sofia
- Council of Ministers. (2014). Bulgarian Strategy for Disaster Risk Reduction 2014-2020
- Council of Ministers. (2006). Disaster Management Act

Council of Ministers. (2013). National Plan for Disaster Protection 2014-2018. 15-16. Sofia, Bulgaria

DYNOT. (n.d.). Bulgarian educational system. Retrieved April 27, 2016, from Website of DYNOT: [http://www.dynot.net/index.php?option=com\\_content&task=view&id=38&lang=bg](http://www.dynot.net/index.php?option=com_content&task=view&id=38&lang=bg)

Fire Safety and Civil Protection Directorate. (n.d.). Working with children. Retrieved April 25, 2016, from Website of the Bulgarian Fire Safety and Civil Protection Directorate General: [http://pojarna.com/bg/sections/rabota\\_s\\_deca/](http://pojarna.com/bg/sections/rabota_s_deca/)

FORETELL. (n.d.). FORETELL: Flood and Fire Safety Awareness in Virtual World. Retrieved April 25, 2016, from Website of Project FORETELL: <http://foretell.eap.gr/>

Marinova S. 2014. Thematic Mapping and Visualization for Early Warning and Crisis Management, PhD Theses, UACEG, Sofia, 166p.

Project for Instructions for training on disaster protection and for providing first aid in the public educational system. (2015). Retrieved April 27, 2016: <http://www.strategy.bg/PublicConsultations/View.aspx?lang=bg-BG&Id=1760>

RACCE, P. (2011). Retrieved April 26, 2016, from Website of RACCE project: <http://racce.nhmc.uoc.gr/bg>

YouthPreventionPro. (n.d.). Retrieved April 25, 2016, from Website of YouthPreventionPro: <http://youthpreventionpro.eu/?lang=bg>

## BIOGRAPHY



### **Dr. Eng. Silvia Marinova**

Silvia Marinova is the General Secretary of Bulgarian Cartographic Association and Chief Assist. Prof. at the University of Architecture, Civil Engineering and Geodesy, Sofia. She is also a member of Bulgarian Chamber of Graduated Surveyors, Commission on Cartography in Early Warning and Crisis Management - International Cartographic Association and Young Scientific Committee - International Society for Digital Earth. She works at KartGeo Ltd. as a cartographer where her main activities are map design and editing. Her science interests are focused on thematic mapping for early warning and disaster management, cross-border mapping, mountain cartography.



### **Kristina Kehayova**

Kristina Kehayova is a student in her final year at the University of Architecture, Civil Engineering and Geodesy, Sofia. Soon she is graduating in specialization Geodesy with profile in Cartography. She is a member of the International Society of Digital Earth. During 23 nov – 4 dec 2015, she participated in the 3rd International Training Workshop on Space Technology for Disaster Mitigation organized by CAS-TWAS SDIM in Sanya, China.