

Some characteristics and problems of the earthquake education practices in Japan

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日本における地震教育に関する実践の特徴と課題

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要旨 本報告では、日本の小・中・高等学校における地震教育の特徴と課題について検討を加える。研究対象としては、論文データベースである Cinii に掲載されている、2012 年から 2018 年の間に公刊された学校教育に関する論文を対象とし、その中から地震教育に関する内容を中心としている 64 論文を選択、分析した。

東日本大震災においては、児童・生徒の死傷率は、学校管理下では非常に低い一方、そうでない場合は比較的高くなる。災害発生時に、地域でどのようなことが起こるのかを学習することが必要である。しかし、低学年の児童には知識教育だけで理解を求めるのは難しい。避難訓練と結びつけた授業計画を立案することが重要である。また、これに当たっては、学校と地域との連携も不可欠である。しかし、特別支援学校や、幼稚園・保育園においては、他の学校と同様の教育を行うことは難しい。児童・生徒の家族と学校とが協働する防災教育が必要である。

日本の災害・防災教育の最も大きな問題は、統一カリキュラムが存在しないことである。防災カリキュラムの確立が望まれる。

キーワード 地震(防災)教育 学校カリキュラム 学校と地域との連携

Introduction

In this study, I intend to clarify about some characteristics and problems of the earthquake education on elementary, junior high and high schools in Japan.

I use articles about earthquake education carried by Cinii which is an article search site of Japan. I extracted articles in conjunction with school education published from 2012 to 2018. What limited an article to a thing published after 2012 is to grasp a characteristic of the earthquake education after the East Japan great earthquake disaster. 64 articles were extracted from this work. I grasp some characteristics and problems of the current earthquake education of Japan through the analysis of these articles.

Method

The earthquake education is very strongly tied to disaster prevention education.

However, the purpose of the disaster prevention education is not clear. I nominate a purpose of the disaster prevention education that children acquire next three ability (HATSUZAWA;2018).

1. Ability to know the area, and to prepare for a disaster
2. Ability to survive at the time of a disaster
3. Ability to revive a region

Local difference is big for disasters. Therefore, the disaster that we must prepare for varies according to an area. So, the study of regional disaster history is important. The thing that is the most important by disaster prevention education is to know what is generated at the time of a disaster here. It leads to surviving at the time of a disaster to know this. The history of disaster teaches us it.

The local topography, land use, and difference in social characteristic are tied to the damage at the time of the disaster closely. To play a central role in this education is social studies (geography education).

An evacuation drill is important to acquire ability to survive at the time of a disaster.

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However, the training content is different from what kind of disaster you assume. The refuge routing is not possible if you do not know the area well. And we can enhance an effect more by performing the evacuation drill with local people. The base of evacuation is regional study.

The object of the ability to revive extends over a person, a town, the society, etc. At the stricken area, the problem that the region contained often expresses it. We cannot solve the problem only by merely putting back an area. We worked on local problem solution through the problem learning in the social studies. Social studies particularly geography education plays a key role of the disaster prevention education.

Findings

Curriculum of the disaster education in Japan

By the school education of Japan, learning about the natural disaster is performed by science, social studies and comprehensive learning mainly. At first, I explain a Japanese curriculum (Table 1). In the science, students learn the mechanism about natural disasters. But the formation or the change of the plateau simply take up in the elementary school and do not take away the disaster directly. Earthquake disaster is taken up in the 1st grade in junior high school. Earthquakes and volcanos are

taken up, and students learn the mechanism of volcanic eruption and the earthquake. Similarly, students learn about meteorological disaster in the 2nd grade in junior high school. In the high school, relations with plate motion and the earthquake and the volcanic activity are taken up. In science education, students learn the mechanism of the disaster in Japan. However, the object of the science education is limited on nature. Social studies (especially geography) education takes charge of the human beings.

In the elementary school, social studies education about disasters and the security is provided in each school year. The 3rd graders learn a hometown about the activity of the fire department and the police ensuring the local security in an example. 4th graders learn about activities to protect from natural disaster, and 5th graders learn about the characteristic of the country and the relations with the disaster. In contrast, the special unit about disasters does not be comprised at the junior high school. They study only summary of natural environments and disaster of the world and Japan. In the high school, geography becomes required in a new course from 2022, and disaster prevention education is taken up greatly in that. The learning about the disaster in social studies establishes an important point in an elementary school and the high school.

Table 1 Curriculum of the disaster education in Japan

Grade		Social Studies	Science	Home Economy	Composite learning
Elementary	3rd	Studies of home town Activities of fire station and police	State of the sun and the ground		Plan it in each school and carry it out
	4th	Supply of the drinking water, electricity and gas Activity to protect people from natural disaster	State of the ground and whereabouts of the rainwater		
	5th	Natural disaster and natural condition of the country	Movement of the water and change of the ground		
	6th		Constitution and change of the earth		
		Geography	Science	Home Economy	Composite learning
Jr. High			Constitution and change of the earth		Plan it in each school and carry it out
			Volcano and earthquake		
			Volcano disaster and earthquake disaster		
		Geography	Science	Home Economy	Composite learning
High			Natural scene and natural disaster	House life in consideration for disaster prevention	Plan it in each school and carry it out
			Volcanic activity and earthquake	Town planning in consideration for disaster prevention	
			Activity and the history of the earth		

Some problems of disaster prevention education in Japan

The disaster prevention education in Japan showed an effect at the time of East Japan great earthquake disaster. The population ratio of the victim of Iwate, Miyagi, Fukushima prefecture were 0.34%. However, the population ratio of the victim remains in 0.08% when I limit it to the students from a kindergarten to the high school. I can judge the correspondence of the school at the time of the disaster to have been appropriate. However, there is a problem, too. 88% of victim of the student happened out of the management of the school. In the place without the instruction of the teacher, many students died. This result shows a limit of the disaster prevention education of Japan. Murakoshi and Muramatsu(2014) point out that development of the disaster prevention education to bring up independence of will and an intellectual power is necessary.

Importance of the knowledge education

In addition, Murakoshi and Muramatsu point it out about the importance of the knowledge education. According to the survey by Murakoshi and Muramatsu, it is shown as a person who has a lot of knowledge about the disaster, his/her consciousness about the disaster prevention is high.

KUNUGIDA Keitaro and KURODA Takuya (2016) performed the questioner survey to high school students for the correspondence to a big fire and the later revival and showed that learning of the history of local disaster is necessary to raise disaster prevention awareness. In addition, KUNUGIDA and KURODA show that to push forward revival, it is necessary to raise the political literacy of local inhabitants since before a disaster occurred.

Importance of the fieldwork

The fieldwork plays a very important role to learn history of local disaster. A specific disaster tends to be generated repeatedly in the specific area. To learn history of local disaster leads to the preparation to a disaster to be caused in the

future. In the fieldwork, we learn various disaster prevention institutions through the local history and can perform the confirmation of the dangerous point in the area, too. In the lower grades, it is difficult to perform disaster prevention education only by conceptual learning. It is for this purpose that an on-site training is made much of in the lower grades. However, it is hard to become a target of the normal on-site training because the disaster is not a thing which generated frequently. Therefore, it becomes important to relate learning of the local history through the fieldwork to disaster prevention education.

Importance of the evacuation drill

The evacuation drill is very important to put on ability to survive at the time of a disaster. Therefore, a lot of studies on evacuation drill are announced. Here, I introduce some unusual studies from that.

TOGAWA Naoki et al. (2017) clarify the effect that evacuation drills give to a real refuge action. TOGAWA et al. analyzed the action that citizens of Ishinomaki-city, Miyagi Prefecture took in the case of an earthquake generated off Fukushima in 2016 and got the following conclusions.

1. He/She becomes able to take the refuge action at the time of a disaster when he/she participate in evacuation drills.
2. The result of the evacuation drill was not accepted about the time to take by a refuge start when the earthquake occurred.
3. The person who participated in an evacuation drill was able to shorten for three minutes to arrive to the refuge place. (The person who participated in the evacuation drills was an average of 14 minutes whereas the person who did not participate in a evacuation drill was an average of 17 minutes.)
4. By the result of the civic questionnaire, the answer that an evacuation drill was useful remained in 60%. On the other hand, the answer that experience helped the refuge of the earthquake of 2016 to East Japan great earthquake disaster reached 80%. The evaluation for the civic evacuation drill is

unexpectedly low.

Trial of a new evacuation drill

As a new evacuation drill after the East Japan great earthquake disaster, I can point out inflection of the urgent earthquake breaking news. Kumagaya Local Meteorological Observatory of Saitama perform the disaster prevention education that utilized urgent earthquake breaking news in cooperation with elementary and junior high schools in Kumagaya-city. The urgent earthquake breaking news is a system giving a warning in the wide area when big earthquake occurs. In the school which carried out this disaster prevention education, an appropriate action was possible at the time of East Japan great earthquake disaster outbreak. This disaster prevention education consists of three phases. The first stage is knowledge education such as an earthquake, urgent earthquake breaking news, and the rule of the refuge action. The second stage is practice of the evacuation drill. The third stage is to inspect the practice.

Improvement of the evacuation drill

TERUMOTO(2012) suggests the improvement of the local practical evacuation drill to an example in Kainan-city, Wakayama Prefecture. Evacuation drills were always carried out in Kainan-city, but they received East Japan great earthquake disaster and reviewed content of the training. The biggest characteristic is fusion of a local disaster prevention drill and the disaster prevention education of the school. The disaster prevention education of the school performs an investigation into history of local disaster. Furthermore, primary school children participate in local evacuation drills as the staff and raises their disaster prevention awareness.

Evacuation drill and disaster prevention education in the school for special needs education

The disaster prevention education of the

school for special needs education (especially schools for mentally retarded children) has a particularly big problem. In those schools, it is difficult to perform the knowledge education like the normal school. Therefore an experience-like evacuation drill becomes more important. However, students cannot cope with the different situation only by repeating merely training. Students cannot judge how they cope if they do not make enough preparations beforehand when they suffered from earthquake out of a school. In the school of special needs education, I think that disaster prevention education and the disaster prevention drill for the protectors are important especially. We must deepen a school and domestic cooperation.

The need of the disaster prevention education in the social education

Similar thing can point out even the disaster prevention education in a kindergarten and the nursery school. The disaster prevention education cannot achieve enough effects only by performing it at school.

88% of student victims who were dead in the case of East Japan great earthquake disaster were out of the management of the school. This shows that social disaster prevention measures are behind the school. We must raise social safety to protect the weak people from a disaster. The expansion of the disaster prevention education which related to social education is necessary.

Revival education

The disaster prevention education must be a bringing up ability to push forward revival. SAKAMOTO & MATSUMOTO(2018) showed a model of the revival education that utilized comprehensive learning in a stricken area of the Kumamoto earthquake (Fig.1). They took up various local problems which occurred after the earthquake disaster in time for composite learning and learned it while deepening the cooperation with the region.

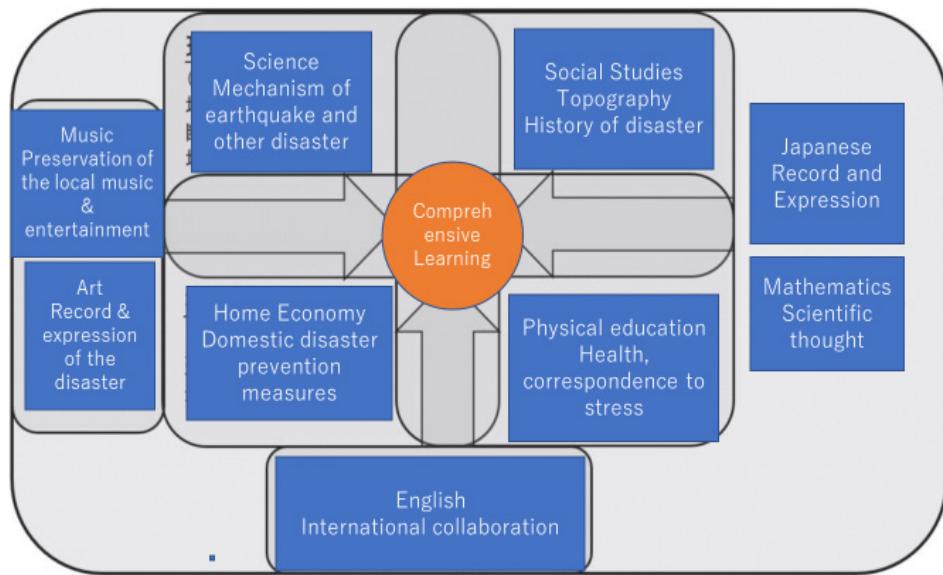


Fig.1 Structure of the Comprehensive Learning

Source: SAKAMOTO & MATSUMOTO (2018)

Problem of curriculum

It is the lack of a systematic curriculum about the earthquake education that I think to be the biggest problem by earthquake education of Japan. The study on experimental curriculum making is limited to a few. The content that students learn in each subject is strongly prescribed in the structure of the subject. For example, the science specializes the analyses such as the outbreak factors of the disaster and geography specializes in the local transformation by the disaster. However, the subject to make these subjects synthesis does not exist. The comprehensive learning is a few opportunities, but the comprehensive learning is left to each school, and disaster prevention education is not necessarily provided. It is demanded that each school make original curriculum, but this is difficult. The making of the disaster prevention education curriculum which considering each subject and each school year is necessary.

Result and Discussion

In this study, I examined a characteristic and a problem of earthquake education and the disaster prevention education in Japan.

The correspondence for the earthquakes of the Japanese school is altitude, and there is very little number of victim of student under the school management at the time of the disaster. However, there are relatively many dead students out of the management of the school, and it is concerned that the learning in the school may not be necessarily understood.

It is knowledge education to understand what kind of thing is generated at the time of a disaster in the area. It is the base of the disaster prevention learning. However, for the students of the lower grades the conceptual thought becomes difficult. Fieldwork is particularly important to the students of the lower grades.

The evacuation drill is important, too. On performing an evacuation drill, it is important to make an appropriate plan which based on regional studies. In addition, I push forward various learning at school in cooperation with regions. And it is necessary to reflect the learning in the school for a regional plan. Such a learning in the school will make the revival education.

However, it is difficult to demand such a learning for students of schools for special needs

education, kindergartens, and nursery schools. It is necessary for a family to cooperate with a school closely to defend the life of these students. The disaster prevention education for a protector and the community is necessary, too.

The big problem of the disaster education of Japan is that a unified curriculum does not exist. The disaster is learned in various subjects including social studies and the science. However, the contents of the disaster learning are not necessarily systematized. It is the cause that the structure of each subject is strong. Some schools utilize comprehensive learning to perform disaster education, but it remains in restrictive movement. It is necessary to make a curriculum of systematic disaster prevention education. Social studies and geography which take away revival of community will become the nucleus of the curriculum.

The disaster exposes various problems that are underlying in a region. We cannot solve these problems only by putting back a stricken area. We must solve regional problems and build the new society. Learning of the social studies and geography is the base of it.

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References

- HATSUZAWA Toshio(2018):How are the social studies made use of for a disaster, disaster prevention education? Editing of the Japanese social studies education society “Social studies education and a disaster, disaster prevention learning” Publication of the Akashi Shoten pp.5-11.
- KUNUGIDA Keitaro & KURODA Takuya (2016):Scientific Literacy and Political Literacy of Student of a Hige School for Pre-Disaster Recovery Planning. Memoirs of the Faculty of Human Development University of Toyama 11-1. pp.123-137.
- MURAKOSHI, Shin & MURAMATSU, Yuki (2014):Current status and future challenges of disaster prevention education in Shizuoka Prefecture. Studies in Subject Development No.2 pp.1-11.
- NAGATA Toshimitsu & KIMURA Reo(2013): Case study research in disaster management education to develop “a zest for life” of children using earthquake early warning system. Institute of social safety science 21 pp.81-88.
- NOZU Maki et al. (2017): The way of refuge and the training of a child learning from East Japan great earthquake disaster. Bulletin of Nagoya junior college No.55 pp.89-110.
- OKA Aiko et al. (2015;2017): Research about the present conditions of large-scale earthquake measures in the blind school. Bulletin of Acupuncture and Physical Therapy Teacher Training School of Tsukuba Univ. 1-1;2-1. pp.11-18;13-20.
- SAKAMOTO Masaya & MATSUMOTO Ryuichi (2018): The period for Integrated studies for disaster prevention studies at junior high school. Psychology, education, welfare study Kyushu Lutheran College No.17 pp.1-10.
- TERUMOTO Kiyomine(2012): Effects and issues of the practical tsunami evacuation drill based on the association with community-based disaster reduction activity and disaster reduction education. Journal of the city planning institute of Japan.47-3. pp.871-876
- TOGAWA Naoki et al.(2017):Effectiveness tsunami evacuation drill for real evacuation behavior Japan Society of Civil Engineering memoirs 73-2. pp.1531-153