

## Disaster prevention as community education: From the viewpoint of activity theory

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There are many social issues that should be solved through activity in the local community, such as community development, social service, environmental protection and disaster prevention. Despite a large number of activities, they are not always effective. In this investigation, we examine some alternative approaches to disaster prevention in local communities based on Japanese research and practices. Activity theory (Engeström, 1987) was adopted as a theoretical viewpoint. Implications for community education, which is another important issue in the community, are also discussed.

*Key words* : disaster prevention, natural disaster, activity theory, learning, local community

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## **Disaster Prevention as One of the Activities in Communities**

There are many social issues that should be solved through activity in the local community, such as community development, social service, environmental protection and disaster prevention. However, despite the large number of activities relating to these issues, these activities are not always effective. Disaster prevention is one such issue among many other difficulties faced by local communities. In this investigation, we examine alternative approaches to disaster prevention in local communities based on Japanese research and practices. Activity theory (Engeström, 1987) was adopted as a theoretical viewpoint.<sup>1)</sup>

Japan has had many natural disasters.<sup>2)</sup> The most recent representative example is the Great Hanshin Awaji Earthquake (Kobe Earthquake), which killed over 6,400 people in 1995. The disaster sent a great shock to the Japanese society because most ordinary citizens believed on nebulous grounds that Japanese society with all of its technological advances was well-prepared to prevent large

casualties and structural damages. Although Japanese society had many disasters after World War II, the restoration and the revitalization of disaster areas were conducted during a time when the Japanese economy grew rapidly. A new task for Japanese society is to prepare for these disasters during times of slow economic growth. Shaw and Goda (2004) describe the damage of the disaster and the reconstruction process of society in detail from a viewpoint of social sciences. They emphasize the importance of community-based reconstruction. One of the most important lessons and social impacts of the disaster was that the Japanese society recognized the role nonprofit and nongovernmental organizations can play in these natural disasters, including the provision of voluntary assistance.<sup>3)</sup> After the Kobe Earthquake, policy and practice for countermeasures against natural disasters need to be substantially improved in Japan.

Most of the disaster victims are not disaster specialists, but ordinary people. Disaster prevention education developed by specialists needs to be disseminated to ordinary people. It is important to help people gain a better understanding of disaster management through a disaster prevention

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1) Engeström (1987) is now out of print, and it is currently available on his website.

2) Disaster prevention has become a key issue not only in Japan, but also in other Asian countries in recent years. Implications in this research can offer suggestions to other potential disaster areas in Asia.

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3) For example, the Japanese society recognized volunteers active in disasters, who are called "disaster volunteers" (Suzuki, Suga, & Atsumi, 2003).

program in their local community. A disaster prevention program can be actualized when it includes the active participation of ordinary citizens.

Previous research argues for disaster prevention programs at the neighborhood level. Simpson(2001) describes the history of Community Emergency Response Training (CERTs) in the United States (abbreviated as U.S.). CERT is a community-based approach to disaster preparedness, and more than 130 active programs were recorded in 26 states in the year 2000. The first CERT program appeared in Los Angeles in 1985 (Simpson, 2001), and it was based on the Japanese local disaster prevention system. Simpson (2002) describes the features of the programs as follows: fusion of education and training, leadership by a neighborhood organization, and local government commitment.

Simpson (2002) conducted a questionnaire survey about BayNET (Bay Area Neighborhood Emergency Training), a consortium of 48 organizations in the area. The research drew three conclusions. First, the quality of the drill exercise depends on the skill of the program administrator in planning the drill, as well as the enthusiasm and participation of the community residents. Second, “drills are a visible means of demonstrating earthquake preparedness, and have an ‘event’ feel to them” (Simpson, 2002, p. 67). Third, “the simulation provides

an opportunity for neighborhood and community residents to speak freely about events and scenarios that are too frightening to contemplate without having the support of friends and neighbors present” (Simpson, 2002, p. 67). These are the most important outcomes of the drills.

CERTs achieved success as a disaster prevention program in the U.S. However, its approach is ineffective when people have insufficient interest in disaster prevention. In Japan, people lack sufficient interest in the risk management of natural disasters. Ordinary disaster prevention programs in the Japanese local community, which comprised the template for CERTs, contain many problems.

#### **Theoretical Viewpoint: Activity Theory**

The activity theory outlined by Engeström (1987) is a model of collective behavior that can help individuals to understand local community activities from a theoretical perspective. Activity theory is based on the socio-cultural approach in psychology, as typified by Vygotsky, and focuses on the actions of groups. Six aspects of activity theory can be identified: subject, object, instrument, rule, community and division of labor. (See Figure 1). Engeström (1987) described human activities as a connection of these aspects of activity and called it an *activity system*.

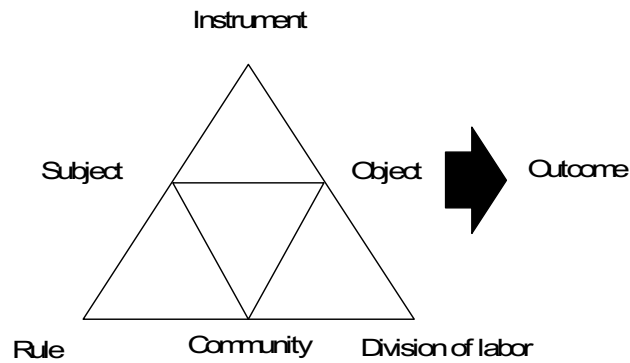


Figure 1. Relationships among the six elements of activity in activity theory (Engeström, 1987)

The triangle model illustrates that each aspect is connected through the mediation of others. For example, subject and object are connected to each other through the mediation of instrument or community. Engeström (1987) stated that “the outcomes of the study are condensed into a series of graphic models” (1987, p.26). The triangular figure is essential for understanding his activity theory. It is important that two aspects are connected by the mitigation of the third aspect in the model. In this theory, learning is identified as a collective transformation of activity.

Although the activity theory is a strong framework for understanding human activity, it was developed mainly in the Western, especially in the European context (Holzman, 2006). Engeström (1987) stated: “Since these models are instruments of thought and practice, they are best understood by

following their creation and by applying them in activity” (p. 26). Therefore, disaster prevention will be discussed in the following sections to justify and modify the activity theory in the non-Western context.

### **Disaster Prevention as a Field of Learning**

#### Changing the Instruments of the Activity: Disaster Prevention Games

Yamori, Kikkawa and Ajiro (2005) developed a card game for disaster prevention, named *Crossroad*. *Crossroad* is a card game that is focused on dilemma situations occurring in disasters. The content of the game is based on narratives collected through interviews with local government officers who worked during the Kobe

Earthquake. Sample questions from dilemma situations included in the game are as follows.<sup>4)</sup>:

[Kobe 1002] (City employee responsible for all evacuation centers) At midnight after the first day of the earthquake, trucks full of relief supplies arrive. Your boss orders you to unload them. But, you are too busy coordinating among the evacuation centers. Do you obey the order? Yes, to obey or No, not to obey (Yamori et al., 2005, p. 169)

[Kobe 1026] (Medical staff member) You are transferring patients to other hospitals. A TV cameraman is taking pictures of them. You cannot endure the picture-taking. Do you allow the pictures? Yes, to allow them or No, to stop them (Yamori et al., 2005, p. 169)

Participants of the game can learn the decision-making process for the dilemma on the earthquake disaster. If the city employee chooses “Yes, to obey” for the Kobe 1002 question, a delay in other restoration issues is inevitable. They will attract considerable criticism from media and citizens if they choose “No, not to obey” because of the delay in the distribution of

relief supplies. In question Kobe 1026, it is relatively easy to refuse the picture-taking. However, there can be problems in the long-term: No one can record the disaster situation without the photographers or camera operators being present.

In the game, participants are divided into smaller groups. Members indicate their decisions on the dilemma situations by showing a Yes/No card all at once. In the game, the participants compete to become a majority force, and for the sake of learning in the game, the facilitator briefly lectures on the dilemma situation following the participants' decisions.

The authors of the game also develop a support system for the users of *Crossroad*. For instance, *Crossroad Shimbun* is a newsletter for the users of the game that is issued, and the authors have also created a training session for the game facilitator.

Yamori et al. (2005) emphasize the importance of instruments in disaster prevention and disaster education. They argue that *Crossroad* includes local knowledge on earthquake disasters and is a kind of software that is used in a local situation, whereas the ordinary instruments in disaster prevention are hardware (such as dykes for tsunamis or earthquake recorders) or software that is universally used (such as disaster manuals or hazard maps). Therefore, changing the instruments is effective in disaster prevention.

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4) The quotes in italics has been translated by the first author.

### Changing the Rule of the Activity *Rediscovery of My Hometown* Workshop

Watanabe (2000) describes an effective intervention program in local communities that is insensitive to disaster. She proposed another type of disaster prevention workshop, “disaster prevention *without* saying disaster prevention.” The research activities included fieldwork within NVNAD (Nippon Volunteer Network Active in Disaster), a nonprofit organization in Nishinomiya.<sup>5)</sup>, which is a part of the area devastated by the Kobe Earthquake in 1995. It also comprised an investigation of a workshop of NVNAD entitled *Rediscovery of My Hometown*, a disaster prevention workshop in the local community. This workshop's design was based on a lesson from the Kobe Earthquake the lesson taught that familiarity with the local/neighborhood community is essential for disaster prevention and relief.

Participants in the program *Rediscovery of My Hometown*, including local children, create a map of their own community through “exploration” (i.e., walking around some blocks in the community) and check points associated with disaster, such as fire cisterns. The key to NVNAD's program was the implementation of the actual activity without showing its abstract goal. The alternative

NVNAD program is called “disaster prevention *without* saying disaster prevention,” whereas the ordinary program is called “disaster prevention *by* saying disaster prevention.”

Instead of emphasizing the importance and significance of disaster prevention itself, the workshop planner emphasizes the enjoyable aspects of the activity, such as walking in their own community with friends and cooking survival food. The programs are well-designed to educate participants on the relationship between disaster and community. Most of the community's facilities and organizations that relate to disaster, such as the fire department, police station, disaster storehouses in schools, and bridge across the small river and water well, are included in the walking route so that children who joined the activity could learn about the relationship between disaster and community.

From the viewpoint of activity theory, Watanabe's (2000) discussion can be re-termed as a change in the rules of the activity. In this workshop, the participants (especially children) joined the activity without specific goals, but with the following phrase: “Let's pick out ‘something kind of worrisome’ in this town!” In other words, organizers do not constrain the object of the activity (i.e. disaster prevention) and tend to emphasize its rules, or “picking out ‘something kind of worrisome’ in this town,

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5) In 2002, NVNAD's head office has been moved to Kobe.

and enjoying yourself in the workshop.”

According to Watanabe's (2000) reports, this type of activity is effective in improving children's understanding of major points from a disaster prevention perspective. It is effective in disaster prevention to change the rules of the activity.

#### Changing the Community of the Activity: *fromHUS*

Suwa and Atsumi (2006) and Suwa, Atsumi and Seki (2006) report on the relief activity of university students in the case of an earthquake. The Mid Niigata Prefecture Earthquake in October 23, 2004 caused serious damage, resulting in 68 casualties. Ever since the quake, both authors promoted volunteering during times of disaster based on medium- to long-term perspectives. The first author launched and managed a mailing list, named *fromHUS*,<sup>6)</sup> which includes faculty and student members of Osaka University among its numbers. The group, which consisted of members on the mailing list, was also called *fromHUS* several weeks after its start. It is important to note that the mailing list was not made by an existing group and that an *ad hoc* mailing list defined the existence of the group.

The activities conducted by members

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6) The name of the group is pronounced *furomu-hyuuusu* and spelled *fromHUS* by the group.

involved offering continuous support for residents of temporary housing, rather than emergency relief for evacuees in shelters. Most of the activity was conducted under the support of NVNAD, which is a nonprofit organization. The significance of the activity was the construction of places in which temporarily housed residents could stay with feelings of comfort and relief, eliminating tension and apprehension.

Members pointed out the significance of university students' voluntary activity during disasters through the examination of a case of *fromHUS*. Most recent university students act with “circumstantial interests” that are not based on coherently logical narratives. The example of how student volunteers with “circumstantial interests” can act effectively in relief was given and the fact that these students learned from the activity was also mentioned.

From the viewpoint of activity theory, Suwa and Atsumi's discussion can be re-termed as a change in the community of the activity. In this case, an ad hoc group of students connected through a mailing list is an alternative community for disaster relief. In terms of disaster prevention, it is effective to change the community of the activity.

Changing the Division of Labor of the Activity: Students as Disaster Prevention Lecturers

Yamori and Kao (2007) report on an important activity of high school students. Hashimoto High School in Wakayama Prefecture created a disaster learning game, which focused on items in an emergency kit and was made in collaboration with disaster specialists. In this activity, students learned about the items of an emergency kit and actually made some emergency kits. Finally, they gave lessons to their younger colleagues and community residents using the disaster learning game. They received feedback on the game from the participants of the lessons and learned about disaster prevention.

Suwa (2005), a high school teacher at Maiko High School in Kobe, also reports on another teaching activity by high school students. The environment and disaster mitigation course of Maiko High School in Kobe was established after the Kobe Earthquake for the development of students' "disaster prevention literacy." In its curriculum, students not only learn about disaster prevention in the high school, but also give instructions on disaster prevention to elementary school students. According to Suwa (2005), this is a very good lesson for high school students.

These activities are regarded as a change of the division of labor. In these cases, students were sometimes transformed into lecturers, offering a change in ordinary disaster education. Students are always

regarded as mere learners, and not as lecturers or practitioners in ordinary disaster education. It is effective in disaster prevention to change the division of labor for the activity.

## Discussion

The four approaches described above are summarized in Table 1. We can recognize that we have alternative approaches to disaster prevention in each aspect of the activity (i.e., instrument, rule, community, and division of labor), and that we have multiple approaches to disaster prevention in communities. We now have enough options to choose from and we need to choose appropriate approaches for each community. Ordinary styles of disaster prevention activity that are also effective in some cases do not have to be eliminated.

According to the discussion of Engeström (1987), a "contradiction" is an opportunity to change the activity system. When the alternative approach begins, a contradiction will arise between the ordinary style and the new style. However, we need not regard it as a problem because it must be the trigger for the creation of new types of activity systems.

In ordinary disaster prevention programs, learning is regarded as the novice's acquisition



Table 1. Comparison of ordinary and alternative activity in disaster prevention from the viewpoint of activity theory

Aspects of Activity	Ordinary Style	Example in general	Alternative style	Example in this article
Instrument	Hardware Software in universal use	Dyke for tsunami or earthquake recorder Disaster manual or hazard map	Software which is used in a local situation	<i>Crossroad</i> , a card game for disaster prevention training
Rule	Disaster prevention by saying disaster prevention	Disaster drill	Disaster prevention without saying disaster prevention	<i>Rediscovery of my hometown</i> workshop by NVNAD
Community	Local Government/NGO/ Other established organizations	Fire department of local government	Ad hoc students' group connected over a mailing list	<i>fromHUS</i> in Osaka University
Division of Labor	Specialists such as local government staff as lecturers	Disaster drill in the local community	Trained high school students as lecturers for community residents or elementary school students	Practices of Hashimoto High School in Wakayama Prefecture and Maiko High School in Kobe

of knowledge that is created by a specialist. Although it is difficult to deny completely in the context of disaster prevention, an alternative view of learning should be added to this perspective from the viewpoint of activity theory. Engeström (1987) described the transformation of the activity system as “learning by expanding.” The transformation of the activity system itself represents a kind of collective learning. Transformations of activities through alternative approaches are an important part of learning in the local

community.

As a practical implication of disaster prevention, we can conclude the following: Each aspect of the activity (i.e., instrument, rule, community, and division of labor) may be changed during ordinary disaster prevention. When the implementers of the disaster prevention try to change their activity, there are at least four options open to them. Each choice of activity has equal significance in terms of disaster prevention.

In addition, we also articulate the outcome

of these disaster prevention activities from the viewpoint of Lave and Wenger's (1991) discussion on their "community of practice" concept. In the Lave and Wenger's (1991) discussion, learning is not only the internalization of knowledge, but also, (1) the creation/preservation/reformation of the community of practice and (2) the reformation of individual/collective identities (Yamori & Kao, 2007). Acquisition of new participants for an activity and the transformation of the roles of existing participants in an activity are also important aspects, as is learning, in disaster preparedness.

In Table 1, "trained high school students as lecturers for community residents or elementary school students" includes both of the two aspects described above. The students joined the disaster prevention community of practice as novice participants and changed their own identities when they trained as lecturers for other novice people. An "ad hoc student group connected over a mailing list" shows the creation of a community of practice. Through the program "disaster prevention *without* saying disaster prevention," the local community can acquire new participants in the local activity. "Software which is used in a local situation" can be used as tools for the creation/preservation/reformation of the community of practice.

There are certain implications for other fields of activity in the local community, such as community development, social service and environmental protection. Although the effectiveness of all fields cannot be guaranteed, there might be four different ways to transform the activities for disaster prevention (See Table 1). The change of the activity, itself, represents "learning by expanding" within the local community. We can conclude that learning in the community might be possible through a change of activity affecting the approach in each aspect of the activity, i.e. instrument, rule, community, and division of labor. This is also an important part of community education.

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