Paper:

Systematization and Sharing of Disaster Management Literacy by DMLH

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The concept we propose for a disaster management literacy hub (DMLH) involves systemizing and generalizing disaster management literacy (DML) and discussing how to design such a DMLH where the general public and disaster responders share materials on DML. In the early 21st century, measures against large-scale earthquakes should essentially include both hardware disaster mitigation measures like the construction of appropriate structures and software measures like disaster preparedness among people and organizations such as the general public, disaster responders and related organizations. We define knowledge about disaster response management and competency as DML. Our analysis of documents on the incident command system (ICS), an emergency response system under the United States Federal Emergency Management Agency (FEMA), found 56 positions of disaster responders in ICS defined by 35 actions required for four types of disaster response competency. The above analysis led us to propose that DML consist of three elements: knowledge for learning about disaster management and mitigation, skills required for effective disaster response, and basic competency and attitudes for coping with disasters. For conceptual DMLH design based on the Instructional Design (ID), we propose three types of learning:

1 The general public and disaster responders learn audiovisually using training videos and materials and review tests on learn from videos.

2 People who want to provide education and training at schools or in regions or municipalities with school teacher guidance/teaching plans learn how to do so.

3 People learn DML by posting or searching for (collecting and arranging) materials.

We discuss how to publish such learning programs, taking as a specific example a life reconstruction support system (to put disaster victims' lives back in order) based on victims' master database.

1. Need for Disaster Management Literacy

In the early 21st century, Japan is predicted to be hit by at least one and possibly three great earthquakes, including a Nankai Trough earthquake and a Tokyo metropolitan earthquake that would inflict massive damage to the Japanese economy and society. Such massive events could not be dealt with sufficiently by hardware disaster mitigation measures like construction of appropriate structures, so we must deal with such events by including software measures like disaster preparedness for populations and organizations.

The disaster management literacy hub (DMLH) we propose enhances disaster management literacy (DML) of the general public and disaster responders and systemizes and shares it. Literacy, which originally means reading and writing competency, is used to refer to knowledge and competency in specific areas. The literacy rate, for example, refers to the ratio of the population in a country who read and write in their mother tongue in daily life. Computer literacy refers to competency in basic computer operations. DML refers in the same way to disaster management competency. Japanese government administration officials and the general public alike often use DML, which is easily searched for on the Internet. DML is often so ambiguously defined, however, that it is often rephrased in other similarly vague words and phrases such as knowledge about disaster management, disaster management capabilities or capabilities of coping with disaster in reference to specific disaster management events. Very few attempts have been made to systemize and share DML. Under these circumstances, the Fire and Disaster Management Agency of the Ministry of Internal Affairs and Communications of Japan has opened an e-college,

a website for e-learning disaster/emergency management complete with video files[1]. The website, mainly intended for firefighters and staff members to view the contents, cannot be freely edited, added to or shared.

In this study, we define DML as "knowledge about disaster management and competency for disaster response" required of the general public and disaster responders. We set two disaster management objectives:

(i) Disaster mitigation, i.e., mitigating the damage from disasters.

(ii) Disaster preparedness, i.e., minimizing unpreventable damage to facilitate post disaster recovery and reconstruction.

To achieve these objectives, we assume that one of the pressing issues of Japanese society today is to systemize and share DML. Based on this assumption, we analyze the systematizing and sharing of DML and propose a conceptual design for DMLH.

2. DML Concept

What does DML mean to the general public and disaster responders? Among available papers, Takemoto et al., 2010 [1] details certain specific individual activities and administrative services, e.g., firefighting, confirmation of someone's safety, evacuation shelters and disaster victim certificate issuance. Very few available papers describe general measures for disaster mitigation and preparedness as systematized and structured under DML.

A standard incident command system (ICS) was first set up in the United States in the 1970s and has in the 30 years since been implemented practically and improved through various types of disasters and events. The US government's Federal Emergency Management Agency (FEMA) studied standard incident management systems in addition to coordinating and financial assistance in disaster response. FEMA's ICS Resource Center website on its home page stores a huge amount of ICS data. Stored materials include documents specifying core competency (**Fig. 1**). In this study, we analyze DML documents stored at the ICS Resource Center to determine what competency is required, for example, of disaster responders and for systematizing DML.

2.1. ICS All-Hazard Core Competency

The ICS All-Hazard Core Competency PDF from ICS Resource Center reference documents [2] describes positions within the disaster response organization, such as that of the "incident commander," and the commander's required duties and specific services (**Fig. 2**). It states specifically that effective emergency management requires the following four types of core competency out of the 56 listed positions:
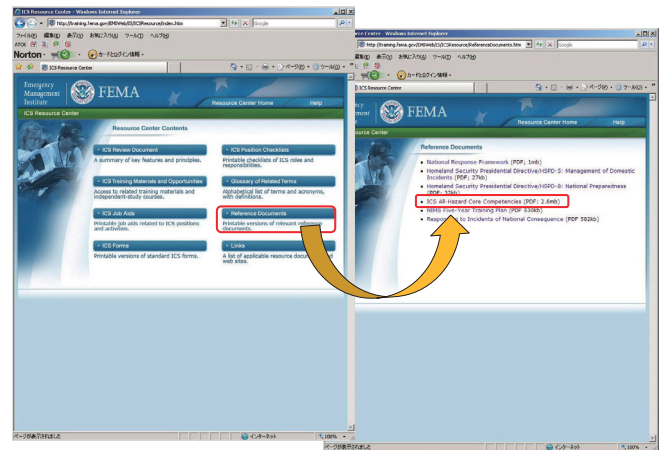
(i) Assuming position responsibilities.
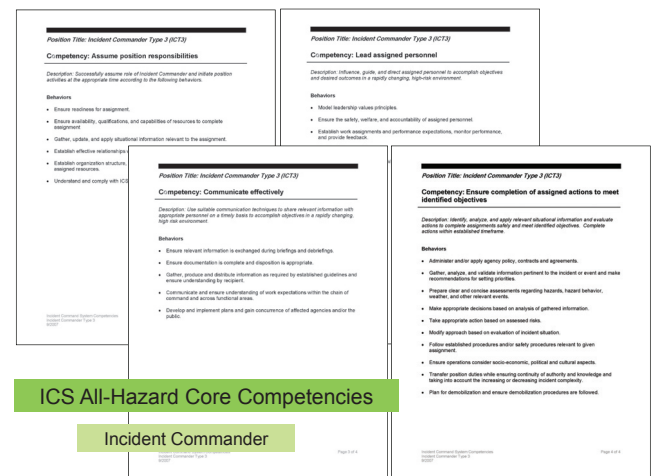

Fig. 1. FEMA ICS Resource Center.

Fig. 2. Actions of Incident Commander in ICS All-Hazard Core Competency.

(ii) Leading assigned personnel.

(iii) Communicating effectively.

(iv) Ensuring that assigned actions are completed to meet identified objectives.

Although specific actions and services differ with the position, they are all achieved by developing these four types of core competency.

The total number of actions for the 56 positions number 1,103. Many of the 1,103 actions are specified for many of the 56 positions, although in slightly different ways, so we have reduced them to 35 grouped by the four types of competency, finding that seven actions belong to competency: Assume position responsibilities, five actions each to competency: Lead assigned personnel and to competency: Communicate effectively, and 18 actions to competency: Ensure completion of assigned actions to meet identified objectives. In other words, if we are educated and trained in advance about these four types of competency and 35 actions, we will be adequately prepared to respond effectively to disasters, so we define them as DML for disaster responders in ICS.
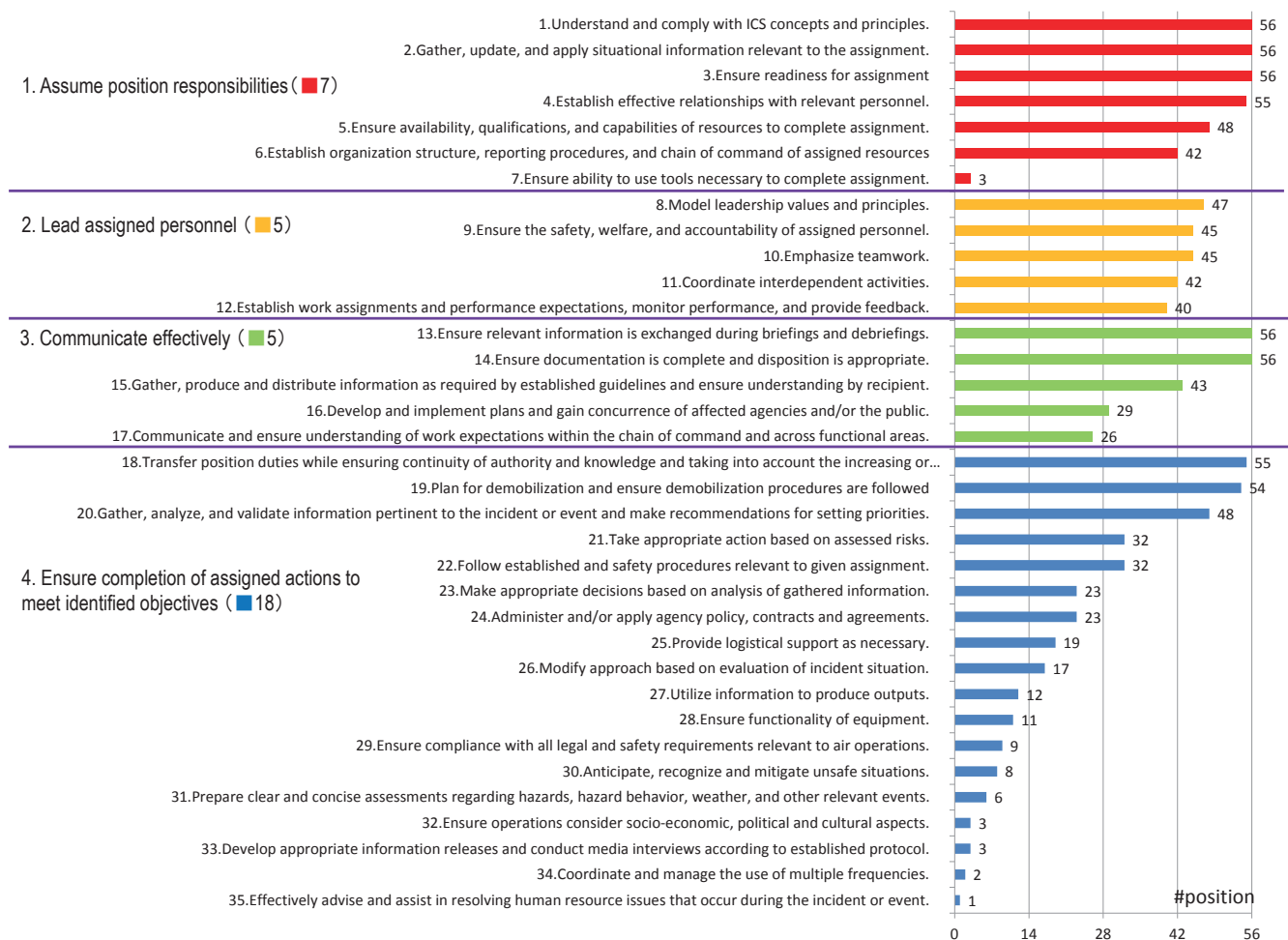
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1. http://open.fdma.go.jp/e-college/index.html

Fig. 3. 35 actions in 56 ICS positions.

2.2. 35 Actions Grouped into Learning Objectives

We further found that some of the 35 actions are specified for each of the positions and others for special positions. **Fig. 3** shows the numbers of positions requiring any one of the 35 actions grouped by the four types of competency. If any one of the 35 actions is required by all 56 positions, for example, it is charted with the number 56. The 35 actions are further reduced from "learning" points of view. To acquire each of those actions, we must take a learning program in which those actions are defined as objectives to be achieved through education and training (learning objectives). After transforming these 35 actions into learning objectives, we grouped them by proximity in learning relevance – meaning that they should be covered by the same education and training – into 12 learning objectives.

For the first competency assuming position responsibilities, we grouped seven actions into three learning objectives:

(i) Understanding and complying with overall organizational response policies, which corresponds to "1. Understand and comply with ICS concepts and principles."

(ii) Ensuring the availability and readiness of human re-

sources, which corresponds to "5. Ensure availability, qualifications, and capabilities of resources to complete assignment" and "3. Ensure readiness for assignment."

(iii) Securing operational structures and environments, which corresponds to "6. Establish organization structure, reporting procedures, and chain of command of assigned resources," "2. Gather, update, and apply situational information relevant to the assignment," "4. Establish effective relationships with relevant personnel," and "7. Ensure ability to use tools necessary to complete assignments." The last action, "7. Ensure ability to use tools necessary to complete assignments" is required for the three positions of air tactical group supervisor, helicopter coordinator, and status/check-in recorder.

For the second competency, leading assigned personnel, we grouped five actions into three learning objectives:

(i) Presenting policies, which corresponds to "8. To model leadership values and principles."

(ii) Ensuring the safety of human resources, which corresponds to "9. Ensure the safety, welfare, and accountability of assigned personnel."

(iii) Coordinating activities and controlling their progress, which corresponds to "10. Emphasize teamwork," "11. Coordinate interdependent activities," and "12. Establish work assignments and performance expectations, monitor performance, and provide feedback."

For the third competency, communicating effectively, we grouped five actions into two learning objectives:

(i) Sharing objectives inside and outside of the organization, which corresponds to "16. Develop and implement plans and gain concurrence of affected agencies and/or the public" and "17. Communicate and ensure understanding of work expectations within the chain of command and across functional areas."

(ii) Ensuring common operational pictures, which corresponds to "13. Ensure relevant information is exchanged during briefings and debriefings," "15. Gather, produce and distribute information as required by established guidelines and ensure understanding by recipient," and "14. Ensure documentation is complete and disposition is appropriate."

For the fourth competency, ensuring completion of assigned actions to meet identified objectives, we grouped 18 actions into four learning objectives:

(i) The ability to resolve operational information problems corresponds to "20. Gather, analyze, and validate information pertinent to the incident or event and make recommendations for setting priorities," "23. Make appropriate decisions based on analysis of gathered information," "27. Utilize information to produce outputs" and "24. Administer and/or apply agency policy, contracts and agreements."

(ii) The ability to resolve human resource management problems, corresponding to "25. Provide logistical support as necessary," "28. Ensure functionality of equipment," "35. Effectively advise and assist in resolving human resource problems that occur during the incident or event."

(iii) The ability to resolve safety management problems, corresponding to "21. Take appropriate action based on assessed risks," "30. Anticipate, recognize and mitigate unsafe situations," "31. Prepare clear and concise assessments regarding hazards, hazard action, weather, and other relevant events," "22. Follow established and safety procedures relevant to given assignment," "29. Ensure compliance with all legal and safety requirements relevant to air operations" and "34. Coordinate and manage the use of multiple frequencies."

(iv) The ability to resolve response-related problems in changing circumstances, corresponding to "18. Transfer position duties while ensuring continuity of authority and knowledge and taking into account the changing situation," "26. Modify approach
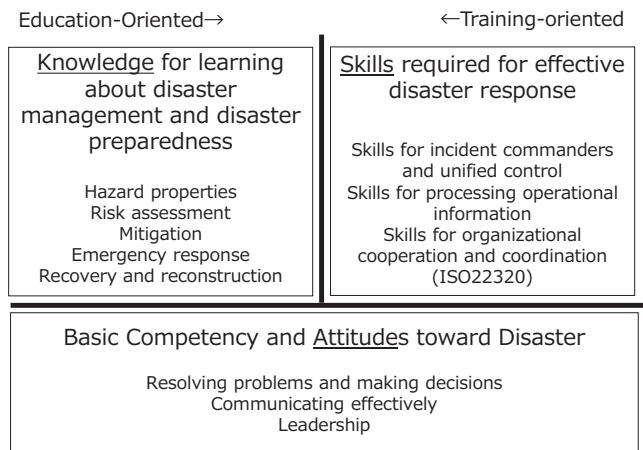

Education-Oriented→   ←Training-oriented

Knowledge for learning about disaster management and disaster preparedness	Skills required for effective disaster response
Hazard properties Risk assessment Mitigation Emergency response Recovery and reconstruction	Skills for incident commanders and unified control Skills for processing operational information Skills for organizational cooperation and coordination (ISO22320)

Basic Competency and Attitudes toward Disaster
Resolving problems and making decisions Communicating effectively Leadership

Fig. 4. DMLH scope.

based on evaluation of incident situation," "32. Ensure operations consider socio-economic, political and cultural aspects," "19. Plan for demobilization and ensure demobilization procedures are followed" and "33. Develop appropriate information releases and conduct media interviews according to established protocol."

As mentioned above, the FEMA-recommended ICS specifies 56 positions and 35 actions for five sections: incident commander/unified command); operations section; planning section; logistics section; finance/administration section. These positions and actions represent DML that disaster responders must learn within the ICS framework. The 35 actions are grouped into 12 learning objectives. In other words, to cultivate disaster responders within the ICS framework, appropriate education and training programs must be implemented to teach these 12 learning objectives.

2.3. DML Scope

Figure 4 shows what is covered by DML that we conceptualized. DML should consist of three elements – knowledge for learning about disaster mitigation and preparedness, skills required for effective disaster response, and basic competency and attitudes toward disaster. This corresponds to the concept put forth by Benjamin Samuel Bloom et al.[2] [3]. Specifically, the four types of competency – assuming position responsibilities, leading assigned personnel, communicating effectively, and ensuring completion of assigned actions to meet identified objectives – and the 12 learning objectives described in the preceding section correspond to basic competency and attitudes toward disaster and largely belong to the affective domain. Knowledge for learning about disaster mitigation and preparedness largely belongs to the cognitive domain and skills required for effective disaster responses to the psychomotor domain.

2. United States educational psychologist who defined the domains of educational objectives by KSA (Knowledge, Skills and Attitudes) representing Cognitive Domain, Psychomotor Domain and Affective Domain (Bloom et al., 1956).

Basic competency and attitudes toward disaster usually cultivated through classroom lectures and training correspond to the types of core competency in FEMA's ICS document – assuming position responsibilities, ensuring completion of assigned actions to meet identified objectives, communicating effectively, and leading assigned personnel. Knowledge for learning about disaster mitigation and preparedness is mainly learned in classrooms and includes hazard properties, risk assessment methods, mitigations, emergency responses, recovery and reconstruction, etc., all considered to belong to the cognitive domain. Skills required for effective disaster responses are mainly learned through training and include command and control, operational information, cooperation and coordination, and other skills as highlighted in ISO 22320 Societal Security – Emergency Management – Requirements for Incident Response, all considered to belong to the psychomotor domain [4].

Some differences exist in specific disaster responses that the general public and disaster responders should learn. Nevertheless, the above three domains are essential to systematically learning DML.

3. DMLH

Having discussed the DML structure and analyzed actions required for FEMA's ICS positions and showing their correspondence to the KSA framework proposed by Bloom et al., we will now discuss whether the proposed disaster management structure would be accepted by local government staff members, especially those of municipalities, who are supposed to act as core disaster responders in Japan.

3.1. Local Government Staff Status Quo

As of January 1, 2013, Japan has about 1,700 local municipal governments. As of October 1, 2010, Japan's population was 128,057,352 people according to the 2010 national census. Simply dividing the Japanese population by the number of municipalities will make the population of a municipality about 75,000. As a basic local authority for disaster response meeting needs of affected residents, each municipality is at least required to

 (i) Recommend or provide instruction in evacuation.

 (ii) Set up warning zones.

(iii) Open and operate shelters.

Many small municipalities with populations of several tens of thousands, have very few staff members in charge of disaster management except for fire station staffs, and many of those in general affairs sections are assigned to other services in addition to disaster management. Japanese local government staff members are usually transferred around to a variety of posts every several years, leaving a very limited number dedicated to disaster management services for any length of time. Those who

are transferred to disaster management services posts take DML training courses sponsored by the Japanese government cabinet office and Disaster Reduction and Human Renovation Institution, but not all employees of these 1,700 municipalities can attend such training courses.

A survey by the Fire and Disaster Management Agency of the Ministry of Internal Affairs and Communication in October 2012 showed the status-quo of local government staff members who were assigned to disaster management services as follows (underlining by the authors) [5]:

- A lack of systematic learning curricula makes it difficult to plan and provide such training courses to towns and villages.

- They generally recognize the need to develop human resources for towns and villages, but because systematic training opportunities are very few and daily business always adds pressure, they could not dispatch staff members even to such rare training opportunities, but expect staff members in charge of disaster management services to personally train themselves to enhance their capabilities.

- With little or no special training available, disaster management services staff members are encouraged to embrace the "mental discipline" of practice makes perfect.

- With no lectures or in-house training available, general city government staff members in charge of disaster management services, they do not get a chance understand positions assigned to them by regional disaster management plans and cannot act positively in disaster.

- If training facilities are far from their home towns, town and village staff members find it difficult to attend training for budgetary reasons.

3.2. Proposed DMLH

As described in the preceding section, local government staff members face many difficulties in cultivating DML due to a lack of systematic learning curricula, an absence of experts to plan disaster management, expectations for personal self-enhancement, mental practice makes perfect discipline, little or no knowledge about positions assigned by regional disaster management plans, and training facilities too far away to permit attendance due to budgetary limitations.

Given this background, we propose DMLH in which participants share DML. The word "hub here refers to the center of an action, of a wheel, or the part between the wheel axis and spokes. Computer network or airport line concentrator are examples of hubs. To improve DML, we must develop knowledge, skills and attitudes for disaster management. There are already numerous examples of excellent training approaches and activities, but these are so scattered that only some are available even from
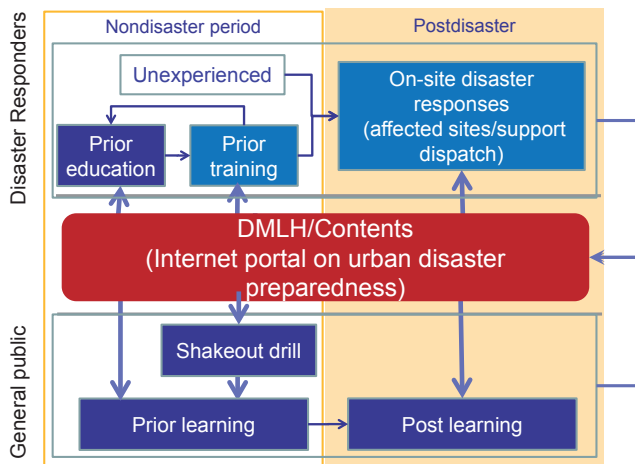
Fig. 5. DMLH use.

websites or in the form of hard copies. Under these circumstances, we propose a structure for the DMLH with a variety of examples and materials on the DML organized in standard format to be collected and published on websites to enable the general public and disaster responders to browse among them and download those they find useful.

Figure 5 shows how DMLH is used. The scheme is on two axes – one indicating general public or disaster responder DMLH users and the other the time when it is used – in nondisaster times or postdisaster. Disaster responders assumed in this scheme are local prefectural and municipal government staff members excluding firefighters, police officers and Japan Self-Defense Forces (JSDF) troopers who are expected to use their expertise and capabilities at any and all times. The scheme is mainly for local government staff members transferred to posts in charge of disaster management but with no experience in or knowledge of disaster response. The scheme represents a case where such local government staff members use DMLH for prior study in nondisaster times and postdisaster training or where they can easily acquire knowledge about services they may be assigned when dispatched to support disaster-affected local governments.

DMLH is also to be used by the general public in local communities or organizations. Using DMLH, they study knowledge for learning about disaster management and preparedness (**Fig. 4**) and basic competency and attitudes toward disaster and skills required for effective disaster response. Designed learning contents include prior learning in basic knowledge about disasters and disaster management and in disaster response and postdisaster learning in long-term victims' life reconstruction (victims' lives back in order) from disaster. Shakeout drills available as an external link connected to DMLH were the largest disaster-fighting drills initiated by those related to disaster management services in the US in 2008. In Japan, the first shakeout drill was conducted in Chiyoda Ward, Tokyo, on March 9, 2012, with participation by schools, businesses and other organizations. The shakeout drill featured large numbers of participants from many different

positions who used disaster scenarios based on the latest seismic data. Participants take the three most important and simple actions to ensure safety in an earthquake – drop, cover, and hold on. Shakeout drills provide continuous routine training to the general public so participants get habituated to such actions and do not become disoriented even in the greatly changed environment presented by an earthquake or other disaster. In DMLH, this is an important element in shakeout drill learning among residents.

3.3. Three Types of Learning Provided by DMLH

We studied the format in which DMLH materials and examples should be provided and came up with the following types of learning:

(i) Audiovisually learning with teaching materials and review tests viewing training videos. Participants use videos to learn contents and instructors use them to get a knack for how to give instructions. This "video" learning type uses training videos and teaching materials in the form of PowerPoint PDF files that facilitate learner understanding. Instructors planning to provide training on the same contents in their own communities audiovisually get a knack for how to give instructions by viewing such training videos. Instructors also download instruction materials (PowerPoint files), guidance/teaching plans, and data transcribed from video tapes (Word/PDF files). While it may be troublesome to prepare and upload materials in this type of learning, video data once photographed has the advantage of visually delivering maximum information to learners and instructors accurately and efficiently. Materials to be downloaded are protected by passwords as necessary.

(ii) Enabling those who plan to provide education and training at schools or in regions or communities on guidance/teaching plans that teachers use at schools to get a knack for how to give education and training and instructions (teaching with guidance/teaching plans). This features instructor friendliness of teachers who plan to give disaster management education at schools and local residents/administrative staff members who plan to provide classroom training or study meetings for understand procedures instructors follow in providing such education and training. Those who prepare and upload DML materials using this type of learning must prepare guidance/teaching plans in addition to teaching materials. School teachers who constantly prepare and use guidance/teaching plans will find this type of learning easy to use.

(iii) Learn by posting or searching for DML materials (collecting and arranging materials). Material is uploaded, shared, search for by using key words, or downloaded as URL/images/videos/document files to enhance DML. This features learning using materials that "look useful," if not systematic training

http://www.drs.dpri.kyoto-u.ac.jp/ur/hub/

Fig. 6. Page 1 of DMLH.

materials, that are easily uploaded, shared, transmitted, searched for or downloaded. Both learners and instructors browse or search for a variety of useful materials for learning or instruction. You can browse or search the materials stored for the first two types of learning on this page.

3.4. DMLH Page 1

Figure 6 shows DMLH page 1. As of this writing, we had opened a website[3] in Japanese because it was intended for Japanese users. Page 1 describes what DMLH means, scenarios where DMLH is used, and types of learning provided by DMLH, i.e., learning with videos, teaching with guidance/teaching plans, and collecting and arranging materials, each having its own links.

The meaning of DMLH is described at the top of page 1 as follows:

> DMLH is a site (hub) on the Internet from where to learn how the general public/disaster responders mitigate disaster damage (damage mitigation) and the DML competency required to minimize unpreventable damage and promote recovery and reconstruction (disaster preparedness and recovery).
> DMLH also provides DMLH knowledge for learning about disaster management and preparedness, skills required for effective disaster response, and basic

3. http://www.drs.dpri.kyoto-u.ac.jp/ur/hub/

competency and attitudes toward disaster. Disaster responders use DMLH for prior education and postdisaster training in nondisaster periods and for on-site disaster response in a disaster. Members of the general public use it for learning and training in nondisaster periods and for postdisaster learning in a disaster.

We intend to improve DMLH website and welcome all advice and comments.

3.5. Instructional Design (ID)

The overall DMLH structure is designed based on instructional design (ID), learning theory from pedagogy/psychology/educational engineering. ID is mainly used to study education and training frameworks for effectively promoting intentional learning by focusing on supporting learning processes rather than on teaching processes.

Among ID theories, we have designed DMLH based on the idea proposed by Gagne et al. in 2004 [6]. They regard the learning objective concept for acquiring knowledge, skills and attitudes (KSA) required to enhance individual competency very highly. Learning objectives refer to the competency acquired by learners and participants when they have completed their education and training, so educational and training programs should essentially be designed in line with learning objectives (the competency to be enhanced). We prepare educational and training programs for disaster responders and the general public by setting learning objectives in disaster response competency terms to be acquired. This corresponds to competency and actions described in FEMA's ICS resource center document in Section 2. It also corresponds to idealistic DMLH and to how education and training should be provided. We have therefore designed and constructed DML based on the theoretical background of ID.

4. Storage and Publication of Learning Programs and Materials on DML

New materials on DML are sequentially added to DMLH. Taking a specific example of a learning program on life reconstruction support with victims master database stored and published on the Web page "learning with videos" (detailed by Tamura et al. in 2012 and Kimura et al.) [7, 8]. We describe how learning programs are stored and published below.

4.1. Publishing Learning Programs

First, click on the learn with videos icon on page 1 and get page 1 of this type of learning (**Fig. 7**), where the following description is given:

> "In this learning type, you audiovisually learn with teaching materials and review tests by viewing actual training videos. It will help learners and instructors to learn the contents and the knack of instructions."

http://www.drs.dpri.kyoto-u.ac.jp/ur/hub/index_a.html

Fig. 7. Page 1 of learning with videos in DMLH.

http://www.drs.dpri.kyoto-u.ac.jp/ur/hub/program/lh001/

Fig. 8. Page 1 of victims' life reconstruction support with victims master database.

There are also descriptions on pages contained in the program and pages for individual training.

Click on the life reconstruction support with victims master database icon to find the page 1 overall description outlining program contents (**Fig. 8**). Reference documents are also listed to be linked to or downloaded for documents (laws, plans, manuals, etc.) referenced in implementing the program and performance reports linked to or downloaded for results of actual education and training with this program. This learning program consists of plural time blocks of training. The overview of training items lists education and training and training examples and courses, actual examples of education and training. The initial screen shows training item names only except for the overall description, so each icon must be clicked on to find training contents. We decided the page layout based on the type used by Web encyclopedias such as Wikipedia.

Specifically, the overall description is described as follows:

> What is meant by life reconstruction support?
> Once emergency responses after a disaster get settled down, a mountain of work comes up to support life reconstruction of affected residents. Many local governments, although fully aware of services for life reconstruction support, may be at a loss as to what to do and how to tackle things.
> Supporting the life reconstruction of affected residents involves

(i) Building damage assessment.

(ii) Issuing victim's certificates

(iii) Providing consultation about life reconstruction. It requires quick, accurate processing and management of much information on affected people. A consistent system has been developed to deal with services from building damage assessment to proactive life reconstruction support with a victim master database, based on postexamination of Mid Niigata Prefecture Earthquake, Chuetsu-Oki Earthquake and Great East Japan Earthquake materials.

From this page, get the whole picture of life reconstruction support, support services, and actual training examples, including how to use the system. For details, refer to references. Actual training examples introduced on this page include one-day prior training in a nondisaster period in Meguro Ward, Tokyo, and short posttraining in the event of a flood in Uji City, Kyoto, in 2012.

4.2. Publishing Specific Training Items

Get actual training items from the training examples/courses page. Training items are arranged on this page so that learners visually follow learning procedures. **Fig. 9** shows the case of Meguro Ward, Tokyo. The

Fig. 9. Page contents of training courses selected by clicking on the training item icon in training examples and courses.

Fig. 10. Page on training items – overview of victims' life reconstruction (40 minutes).

basic course for learning life reconstruction support services (earthquakes) is the basic training program for local government staff members (personnel in charge) to understand what is meant by life reconstruction support and to learn specific services and skills in a nondisaster period (building damage assessment examinations for earthquake damage). In short, Implementation Period: nondisaster period; Disaster: earthquake; Duration: one day; Intended Users: disaster responders (administrative staff members, etc.); Implementation status of this program; Remarks. Training items are classified into Primer (training item code number 10s), Outline (100s), Details (200s), Exercises (300s), Specials (400s). In the above case, the training course consists of 11 time blocks of training items ranging from 0l01 Overall picture of victims' life reconstruction support (duration: 40 minutes) to 0701 Various consulting services for life reconstruction (duration: 20 minutes).

Go to the page on training items by clicking on the training items icon. Clicking on 0101 Overall picture of victims' life reconstruction support displays the page in **Fig. 10**. There are also learning objectives described below the training item name. Learning objectives represent the competency acquired through training items, which is a highly regarded concept in ID. Also on the page are video- and lecture-teaching materials used in training

(PDF PowerPoint slides) to ensure that learning objectives are achieved. Below teaching materials are review tests (questions and answers) for checking whether learning objectives have been achieved. Download teaching materials instructors actually use, listed at the bottom of the page. For the above training item, download lecture materials (PowerPoint), lecture guidance/teaching plans (lecture flow given by the instructor) (Word), and the lecture flow (videos transcribed into text) (PDF). Teaching materials are protected by passwords at the request of the authors, who must be contacted for permission to use materials.

We can advance our learning and use of those materials enables local government staff members to act as instructors training other staff members within their local governments. This makes a big difference from e-learning only accessible only on the Internet. DMLH both targets helping users browse and learn materials stored on the Internet and enables users to obtain instruction materials to be used at schools, communities, or local governments, thus eliminating the need to invite disaster management specialists to give lectures or to take days off to go to training venues and enabling them to provide training to other local government staff members suited to the local situation.

5. Projected Development

As of this writing in December 2013, over a year had passed since the DMLH project was launched. In this paper, reporting the one-year outcome of the DMLH project, we have discussed the necessity and framework/conceptual design for DMLH by comparing and reviewing the US case of standard disaster response system ICS and the Japanese training system for disaster response for use by staff members in charge of disaster responses and disaster management at local governments. During the remainder of the 5-year project, we will continue to improve and expand DMLH by storing and publishing more education and training programs. Specifically, we would like to store and publish DMLH education and training programs and materials for the general public and disaster responders representing the outcome generated by the Project to Mitigate Disasters of Extreme Severity Caused by Urban Vulnerability sponsored by the Ministry of Education, Culture, Sports, Science and Technology of Japan, which also provided funds for this DMLH project. We will also store education and training programs to be implemented across Japan on the DMLH site.

We first plan to increase the number of education and training programs and materials to be stored and published on DMLH. As programs and materials increase in number, we must structure or systematize DMLH contents, which will lead us to inductively structure or systematize DMLH. We will also verify the effectiveness of programs and materials and DMLH through field surveys of disaster responders and the general public to extract the programs required and improvements to be made to DMLH. We plan to construct a system that is very practical and user-friendly through implementation, evaluation and improvements that help the general public and disaster responders enhance their DML and overcome disasters expected to hit Japan in the near future.

Acknowledgements

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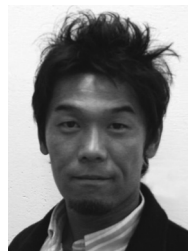
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