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Report

Educational significance and role of disaster preparedness activities through collaboration among a community, a university and the government

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Abstract

As it is difficult to provide disaster nursing training in clinical settings, each university devises appropriate in-school programs. At University-A, disaster nursing is a compulsory elective course, consisting of 15 hours, with 1 credit allocated. City-B, where University-A is located, is adopting city-wide measures to enhance community-based disaster preparedness. Having been newly founded, University-A needed to establish favorable relationships with City-B and residents' associations in the periphery, and it was preparing for a partnership agreement with the city to promote community-based disaster preparedness at the time of this study. As part of the Disaster Nursing course, we made arrangements for our students to participate in a comprehensive disaster preparedness drill (drill) held by City-B as an experience-based learning opportunity to visualize actual disasters. Students' participation in the drill was approved by the university, local government (Crisis Management Team of the city), and residents' associations after the submission of relevant plans and explanation. We also held a series of open seminars for community residents to learn about disasters prior to the drill, and for communication with them.

This paper reports these disaster preparedness activities performed through community-university-government collaboration, involving students, and discusses their educational significance.

Key words: disaster preparedness activity, educational significance, collaboration

Ⅰ. Introduction

Natural disasters, which frequently occur these days, markedly affect our daily lives. People have begun to pay more attention to the influence of disasters, and disaster preparedness activities are expanding little by little as part of community life. University-A was newly founded in City-B, and the latter is implementing measures to enhance community-based disaster preparedness. At the time of this study, University-A and City-B were preparing for a partnership agreement to promote such preparedness. The Ministry of Education, Culture, Sports, Science and Technology (2012) defines the roles of private universities in communities as follows: "developing human resources that contribute to each community and providing a basis for community development with students as a motive force", and "providing opportunities for community residents to learn throughout life and creating an intellectual community". In order to create an intellectual community with students, it is necessary to clarify the role of the university expected by the community. In the case of City-B, disaster management was one of the important points. In basic nursing education, the Disaster Nursing course, consisting of programs for nursing integration and practice, helps students learn about disasters and disaster preparedness with expertise. Regarding disaster nursing, the basic idea of nursing education is "helping students obtain basic knowledge of

nursing to provide support immediately after a disaster" in the 〈Nursing Integration and Practice〉 section of the Operational Guidelines for Nurse Training Facilities (Ministry of Health, Labour, and Welfare, 2018). Thus, students are expected to acquire basic knowledge of disaster nursing. The disaster nursing curriculum focuses on experience-based learning to acquire such knowledge. As for the educational significance of experiences, the Ministry of Education, Culture, Sports, Science and Technology (2018) has raised concerns over the negative influence of indirect or simulated experiences on the growth of children, and places importance on their direct experiences or direct interactions between them and other persons, objects, and society. The sharing of community-based disaster preparedness approaches being promoted in City-B may be a useful direct experience-based learning opportunity for students. Furthermore, their participation in community-based activities oriented toward disaster preparedness may clarify the roles of University-A, thereby promoting community-university collaboration.

Therefore, we made arrangements for our students to participate in a disaster preparedness drill (drill) held by City-B each year, and promoted communication and collaboration with the community and local government. This paper discusses the educational significance of these disaster preparedness activities performed through community-university-government collaboration for both students and community residents.

Ⅱ. Objective

To clarify the educational significance of disaster preparedness activities performed through community-university-government collaboration, involving students.

Ⅲ. Disaster preparedness activity through community-university-government collaboration

1. Contents of activity

There were mainly 4 contents of activity : first, we explained methods for community-university-government collaboration, with students participating in the drill, and coordinated to obtain approval from each party ; second, we held a series of open seminars for community residents to learn about disasters prior to the drill ; third, students participated in the drill as part of the Disaster Nursing course in September of the third year after the foundation of the university ; and fourth, we received requests from residents' associations and the local government for participation in their community-based disaster preparedness activities (Table 1). The educational significance of these activities was examined through evaluations by both students and community residents. The 53 students who had participated in the drill subsequently evaluated it, and submitted learning reports. Additionally, a questionnaire survey was conducted, asking the 38 and 72 community residents, a total of the 110 residents, who had participated in the seminars in July and August of the fourth year after the foundation of the university, respectively, to describe their impressions of the seminars. The study period was from September 2016 to March 2018.

2. Details of the activity

1) Collaborating with and coordination between the local government and residents' association, as shown in Table 1 : Community-University-Government Coordination and Collaboration Progress Chart
2) Planning for the students to learn through direct experience in the community

Participation in the drill held by City-B : The students were in charge of 4 booths during the drill : assisting the Self-Defense Forces to distribute meals (curry), creating corrugated cardboard beds in a shelter, acting as simulated victims (with moulage), and operating an exhibition booth (Children's Square).

3) Educational activities through community-university-government collaboration
   (1) Holding 2 open seminars for community residents to learn about disasters prior to the drill.
   (2) Making arrangements for faculty members/students to participate in community-based activities at the request of other districts/the local government, and holding the third open seminar for community residents.

3. Evaluation

1) Students : We asked the students to evaluate the educational effects of the drill on a 5-point scale (5 : Very educational, 4 : Educational, 3 : Not educational, 2 : Not educational at all, and 0 : Did not participate). We also analyzed their free descriptions as learning reports submitted after participation.
2) Community residents : We conducted a questionnaire survey after the seminars, asking the

Table 1 Community-University-Government Coordination and Collaboration Progress Chart

Period	Contents	Students	Others
September of the third year	1) Coordinating within the department, coordinating and collaborating with the Department of Examination-related Public Relations, and presenting a draft plan for the Disaster Nursing course 2) Asking the Crisis Management Team of City-B to cooperate		
October	1) Deliberating with the person in charge of the Crisis Management Team > Discussing the feasibility of students' participation in a comprehensive disaster preparedness drill held by the city based on a partnership agreement between the university and city to promote community-based disaster preparedness		
November	Concluding and signing the partnership agreement		
April of the fourth year	1) Holding a meeting with the person in charge of the Crisis Management Team 2) Deliberating with residents' associations in the periphery of the university > Discussing the feasibility of students' participation in the drill with the president of the residents' association of District-C (as a coordinator for collaboration with the person in charge of the Crisis Management Team)		Confirming the contents of the accident insurance plan for students and students' status of subscribing to it in the initial year
May	1) Meeting the presidents of several residents' associations in the periphery of the university (coordinated by the president of the residents' association of District-C) 2) Deliberating and coordinating collaboration for community-based disaster preparedness activities with the president of the residents' association of District-C > To hold open seminars for community residents prior to the drill		
June	1) Recruiting volunteer students for the seminars scheduled in July and August 2) Holding a meeting on the seminars with the person in charge of the Crisis Management Team and president of the residents' association of District-C > Creating posters and asking the residents' associations to display and distribute them		
July	1) Holding the first open seminar, entitled : [Free Spaces to Maintain Children's Mental and Physical Health] > Lecturer : Save the Children Japan > Contents : play activities and emergency food tasting for children (allergen-free products and snacks)	9 volunteers	Number of participants : 38

Table 1 Community-University-Government Coordination and Collaboration Progress Chart

Period	Contents	Students	Others
August	1) Holding the second open seminar, entitled : [Establishment of Shelters by Residents' Associations to Maintain Victims' Mental and Physical Health] > Lecture and experience-learning (map exercise and presentations) > Contents : exhibition of products for evacuation and disaster preparedness	5 volunteers	Number of participants : 72
September	**1) Students' participation in the drill (during 2 class sessions of the Disaster Nursing course)**	**53 participants (taking the Disaster Nursing course)**	
	2) Request for participation in community-based activities from the residents' association of District-D > Collaboration during community-based disaster preparedness activities (participation in those to create 'free spaces for children)	3 volunteers	
November	1) Request for participation in community-based activities from the residents' association of District-E (demonstration of emergency care methods using daily products available in shelters)	9 volunteers	
January	1) Holding the third open seminar, entitled : [Emergency Care Methods That Are Feasible for Community Residents] > Lecture and experience-based learning (consciousness level test, compression hemostasis, fracture fixation) > Contents : eating emergency food products (canned bread and vegetable soup) for lunch 2) Request for participation in community-based activities from the Crisis Management Team > Participation in civil protection training (as simulated victims)	2 volunteers 28 volunteers (second year)	Number of participants : 91

community residents to evaluate the educational effect of each theme on a 5-point scale (5 : Very educational, 4 : Educational, 3 : Neutral, 2 : Not educational, and 1 : Not educational at all). The residents' impressions of the seminars (in a free-description style) and the number of participants were also investigated.

3) The numbers of requests for participation in community-based activities from other districts and the local government were also totaled for evaluation.

4. Analysis

The results of the evaluations using a 5-point scale by the students and community residents were quantified through simple tabulation. Their free descriptions were examined through content analysis using KH Coder 3 as a tool to quantitatively analyze text data (Higuchi, 2014). Analysis using KH Coder 3 is characterized by a 2-phase process : Phase 1 : summarizing and presenting data while avoiding any influence of analyzers by using multivariate analysis ; and 2 : creating coding rules to explicitly verify theoretical hypotheses and search for critical points. To extract words from the obtained data, the morphological analysis software ChaSen was used. Word-word similarities were measured using the Jaccard coefficient to create co-occurrence networks. In each co-occurrence network, words with similar patterns of appearance or higher co-occurrence levels are connected by lines (Higuchi, 2014, P155). The Jaccard coefficient measures the similarity between 2 sample sets, with a range from 1 to 0 and higher values indicating higher word-word similarities (Higuchi, 2014, P39). In contrast, hierarchical cluster analysis uses the Ward method and Jaccard distances. The Jaccard distance (word-word dissimilarity) is calculated by

deducting the Jaccard coefficient from 1. As the Ward method was adopted for clustering in the present study, Jaccard distances might range beyond 0–1. Therefore, the Jaccard distances used for hierarchical cluster analysis were regarded as indicating higher word-word similarities when their values were lower.

Ⅳ. Ethical considerations

Prior to the start of the Disaster Nursing program, we explained to the students the objective of this study, use of data from their evaluations and learning reports for it, that there will be no disadvantageous treatment for those refusing to cooperate with the study in terms of learning achievements, and publication of the results. We regarded a circle in the acceptance box of each learning achievement evaluation form/report as consent from each student.

Similarly, a written document, explaining the objective of this study, and use of data from their responses to a questionnaire survey that would be conducted after the seminars for it, was distributed to the community residents at the start of the seminars, asking them to enter a circle in the acceptance box of the questionnaire if they consent to cooperate, and drop their responses into a submission box.

The study was approved by the ethics committee of the study facility (approval number : 18).

Ⅴ. Conflicts of interest

There is no conflict of interest with any company in relation to the study.

Ⅵ. Results

1. Students

During the drill, a total of 53 students played the following roles at the request of the local government : 10 assisted the Self-Defense Forces, 15 created corrugated cardboard beds, 16 acted as simulated victims (with moulage), and 12 operated the exhibition booth (Children's Square). Consent to cooperate with the study was obtained from 24 (45.3%). The mean evaluation score was 4.46. On analyzing the contents of their learning reports using hierarchical cluster analysis (Figure 1), the Jaccard distance was 0.2 between 〈drill〉 and 〈disaster preparedness〉, 0.25

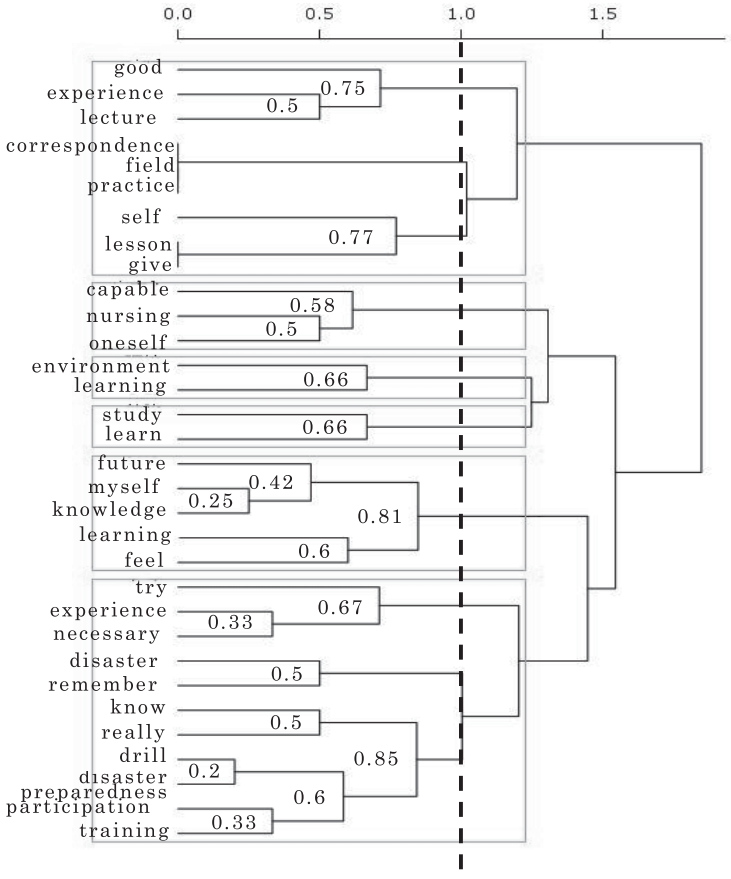

Figure 1 Hierarchical Cluster Analysis of Student Learning Reports

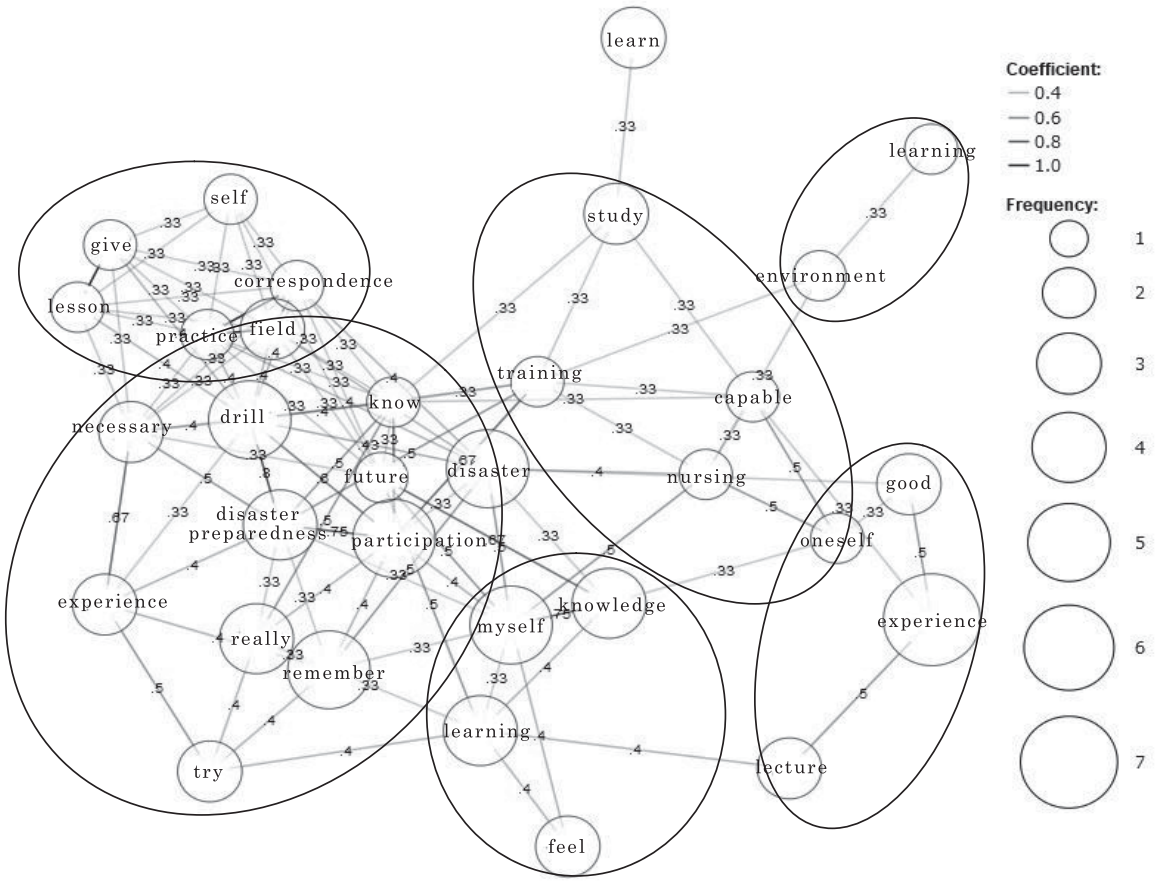

Figure 2 Co-occurrence Network Diagram of Student Learning Reports

between ⟨self (myself)⟩ and ⟨knowledge⟩, 0.33 between ⟨experience⟩ and ⟨necessary⟩, and 0.33 between ⟨participation⟩ and ⟨training⟩. In the co-occurrence network created (Figure 2), co-occurring words are directly connected, and they are classified into 6 categories (marked with circles). In the category with the largest number of words, ⟨drill⟩ is connected with ⟨know⟩, ⟨necessary⟩, ⟨disaster preparedness⟩, ⟨participation⟩, and ⟨disasters⟩, while ⟨experience⟩ is connected with ⟨disaster preparedness⟩, ⟨actual⟩, ⟨necessary⟩, and ⟨see⟩.

2. Community residents

The number of open seminar participants was 38 in July, and it increased to 72 in August. Among the 110 total participants, 49 (44.5%) evaluated the educational effects of the seminars, and the mean score was 4.28. On analyzing their free descriptions regarding the seminars using hierarchical cluster analysis (Figure 3), the Jaccard distance was 0.5 between ⟨students⟩ and ⟨lecture⟩, 0.57 between ⟨seminar⟩ and ⟨participation⟩, 0.57 between ⟨disasters⟩ and ⟨firemen⟩, and 0.67 between ⟨residents⟩ and ⟨approaches⟩, between ⟨community⟩ and ⟨challenges⟩, and between ⟨very⟩ and ⟨good⟩. In the co-occurrence network created (Figure 4), co-occurring words are classified into 5 categories (marked with circles). In the category with the largest number of words, ⟨community⟩ is connected with ⟨disaster preparedness⟩, ⟨university⟩, and ⟨participation⟩. In another category, ⟨lecture⟩ is connected with ⟨students⟩, ⟨detailed⟩, ⟨very⟩, and ⟨good⟩.

The number of open seminar participants increased to 91 in January of the following year, although this value was not added to the analytical data.

3. Requests for participation in community-based activities

The total number of requests for participation in community-based activities was 4 : 2 from the residents' associations of 2 districts for participation in their disaster preparedness drills ; 1 related to the 3rd open seminar for community residents ; and 1 from the local government for participation in civil protection training.

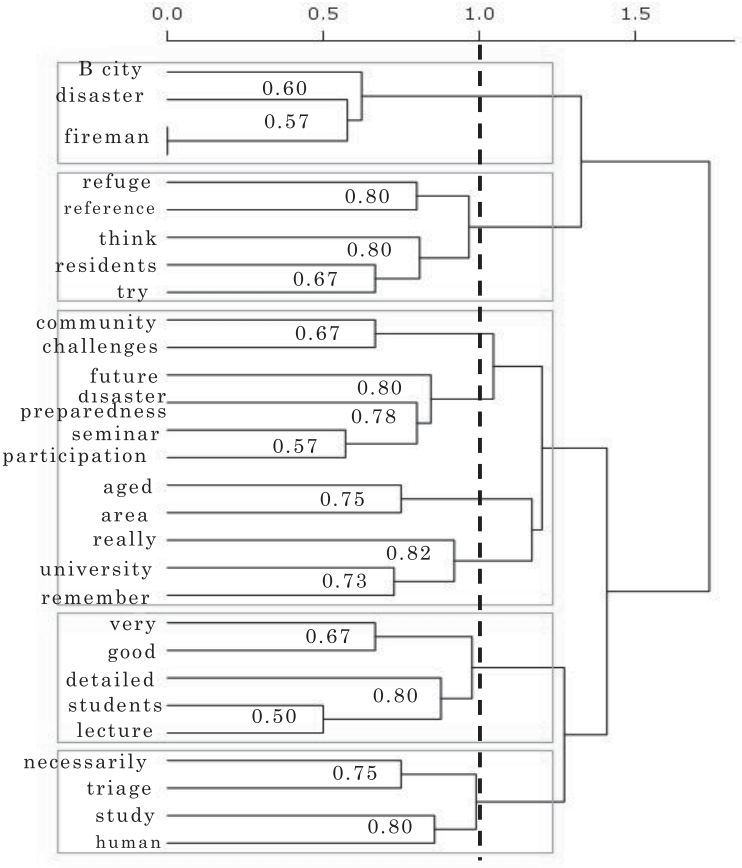

Figure 3 Hierarchical Cluster Analysis of Impressions of the seminars

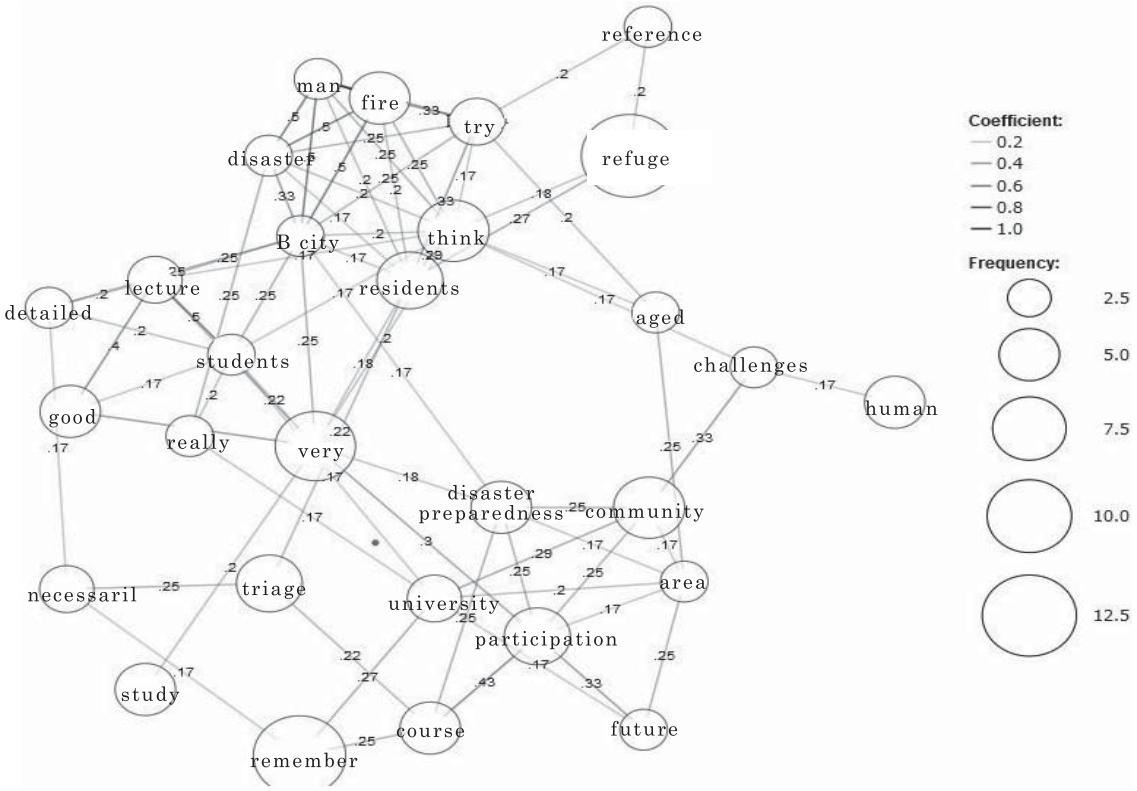

Figure 4 Co-occurrence Network Diagram of Impressions of the seminars

Ⅶ. Discussion

In the student evaluations of the drill, the mean score was as high as 4.46, with all students scoring its educational effects as 4 or 5. During the drill in the community, they cooperated with general citizens and professionals, and developed an understanding of victims' emotions. They described : 〈I felt relieved through communication with members of the Self-Defense Force〉. When assisting with meal distribution and creating corrugated cardboard beds, they smoothly collaborated with community residents. As nearly half of the students had also taken the Public Health Nurse Training course and participated in community assessment, they may have found fieldwork familiar and such an experience may have facilitated their communication with community residents. Students in charge of the exhibition booth (Children's Square) distributed rehydration solutions to children and devised substitutes when they ran out of paper cups. They asked each child to fold a piece of origami paper into a cup. This idea, which was also favorably evaluated by parents and others, was developed based on the situation, confirming that the students appropriately used the knowledge they had acquired through previous learning. Indeed, they stated in their reports that participation in the drill was a helpful experience for their learning and future nursing practice, supporting its educational significance. The students' high mean evaluation score may have mainly represented the senses of solidarity and accomplishment they developed by collaborating with general citizens and experts and by completing a major disaster drill, respectively. On analyzing the contents of their learning reports, the levels of similarity between 〈disaster preparedness〉 and 〈drill〉 and between 〈training〉 and 〈participation〉 were high, and these words were connected with 〈actual〉 and 〈know〉. This suggests that, the students having few opportunities to participate in disaster preparedness drills in daily life thought that they had been able to know the actual situation during a disaster. Similarly, 〈self (myself)〉 and 〈knowledge〉 showed high levels of similarity with 〈future〉, and they were connected with 〈learn〉 and 〈feel〉, indicating that participation in the drill was helpful for the students to learn and feel disaster management as a basis for nursing knowledge acquisition.

The number of open seminar participants increased with time. As the primary contributing factor, the president of the residents' association of the district where the university is located supported the latter's disaster nursing approaches by encouraging community residents to participate in these seminars to promote community-university communication. With community-based disaster preparedness activities being promoted in City-B and the president of the residents' association encouraging other residents' associations to request participation in community-based activities to the university, the university's approaches and students' learning may have been more widely understood. As the secondary contributing factor, the community residents, who focused on the role of the new university in community development, may have been satisfied with its approaches, as they fulfill the needs of their community. For example, on analysis of their impressions of the seminars, 〈(open seminar) lecture〉 organized with cooperation from 〈students〉 showed a high level of similarity with 〈detailed〉, and they were connected with 〈very〉 and 〈good〉. Considering the high aging rate among community residents, it is likely that students creating familiar feelings remind them of their grandchildren. Based on this, the community residents may also have developed positive impressions to see students closely support residents during the drill and food tasting. Furthermore, 〈seminar〉 and 〈participation〉 were connected with 〈disaster preparedness〉 and 〈future〉. They were also connected with 〈community〉 and 〈challenges〉. This may explain that attending lectures, the community residents could learn about other communities' approaches and new measures for disaster preparedness, and such learning made them realize challenges in their communities. In the co-occurrence network, 〈community〉 was connected with 〈disaster preparedness〉, 〈university〉, and 〈participation〉 in the major category, and 〈lecture〉 was connected with 〈students〉, 〈detailed〉, 〈very〉, and 〈good〉 in another category. This may also have represented the community residents' positive impressions of students and enhanced awareness of community-university collaboration to promote disaster preparedness. These approaches may consequently have increased the number of requests from other districts and the local government after the drill.

Thus, the university's plan for students to participate in the drill may have fulfilled the 2 roles of private universities in communities : "developing human resources that contribute to each community and providing a basis for community development with students as a

motive force", and "providing opportunities for community residents to learn throughout life and creating an intellectual community". Asaoka[3] reported that universities specializing in nursing and public health face difficulty in comprehensively collaborating with municipalities. However, the results of the present study suggest that collaboration with communities is also sufficiently feasible in these fields, if it is possible to fulfill their needs and gain their understanding.

Ⅷ. Conclusion

1. The students developed ideas based on the situation, confirming that they appropriately used the knowledge they had acquired through previous learning. Furthermore, they stated in their reports that participation in the drill was a helpful experience for their learning and future nursing practice, supporting its educational significance.

2. The university's plan for students to participate in the drill also motivated the city to adopt city-wide approaches to promote community-based disaster preparedness. In addition to this, cooperation from the residents' association of a district also increased the number of requests for participation in community-based activities from other bodies. Therefore, the university's approaches may have had an educational significance in promoting collaboration and mutual understanding among the community, university, and local government.

Acknowledgment

The authors would like to express their deep gratitude to the late president of the residents' association, who provided full assistance and support for us to participate in the drill and hold open seminars. May he rest in peace.