Local Support for Lifelong Learning with Science Experiment Courses (2)

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Abstract

This paper shows the activities for assisting elderly people in lifelong learning in science. We conduct such activities with the following three methods: (1) to open a class in scientific experiment, cooperating in the lifelong learning lectures held by municipalities targeted at elderly people; (2) to plan an original one-time lecture in scientific experiment targeted at elderly people; and (3) to hold a class at welfare facilities for elderly people. (1) emphasizes the reintroduction to science, with the purpose of utilizing the knowledge of the aged and the outcome of learning activities in local communities. (2) emphasizes the promotion of inter-generational exchange through science, with the purpose of developing opportunities to hand down wisdom. (3) emphasizes pleasure in participation, with the purpose of assisting elderly people in spending every day lively. This paper reports on our activities so far.

Lifelong Learning

According to the 2008 White Paper on Aging Society, the total population of Japan as of October 1st 2007 was 127,771,000. Elderly over the age of 65 accounted for a record-high 21.5% of the total population with 27,464,000 people [1]. As the number of births in Japan has failed to rise, it is estimated that the population will peak in 2009 and then begin to decline. Accompanying this increase in the size of the elderly population, the number of people who participate in lifelong learning courses is expected to increase as those people look for chances to become familiar with the local community, purpose in life, and relaxation. Additionally, increases are expected in the number of people looking for courses which stress more high-level, practical science rather than courses stressing knowledge for pleasure.

Lifelong learning is learning continually throughout one's life, and the places of learning are homes, schools, workplaces, and local communities. Examples of local communities and universities working together to form local cooperative learning programs can be seen in Japan and America among other countries [2],[3],[5]. There are also examples of universities and colleges supporting manufacturing education and science education [4].

Local Support for Lifelong learning

(1) Science Experiment Course for the Elderly

Nonoichi Town is a commuter town next to Kanazawa City, the location of the Ishikawa Prefectural Office. Because living here is convenient, the number of people moving to this town from outside the municipality is increasing every year. As of October 1st 2008, the population was 49,705. The breakdown of the population is 7,358 people below the age of 15, 35,171 people from the age of 15 to under the age of 65, and 7,164 people age 65 or older (population aging rate of 14%).

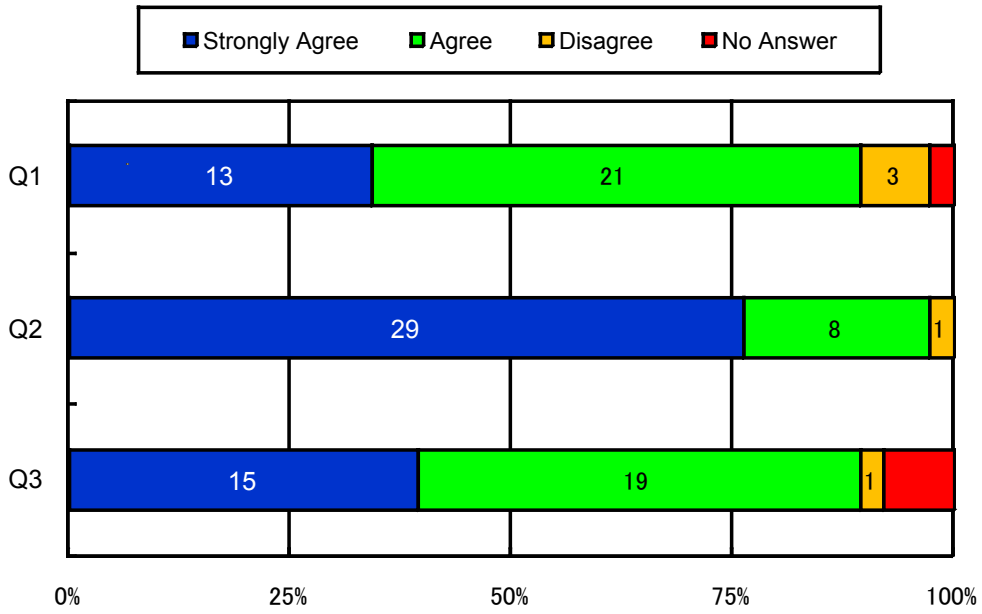
The Nonoichi Long Life College was established in this municipality in 1987. We started to participate in this lifelong learning course as instructors in 2005. Currently, we have two themes, "making batteries with the things around you" and "experiencing the world below freezing with liquid nitrogen", and both themes are being taught in courses. The classes take the form of a class which moves forward while going back and forth between explanations and experiments. We use the town's community center as a classroom and separate the students into groups of 4 to 6. The

goal of grouping the students is to promote communications with other participants and to give a feeling of being a child again through the science experiments.

We carried out a post-course questionnaire survey on the 38 participants (average age: 69.7) of the course that finished on August 8th, 2008. The participants were elderly who attend the Long Life College and weren't particularly a group of people who all have an interest in science. As shown in Figure 1 (Q1), 89% of the participants responded to the question "Are you interested in science?" with "I am very interested" or "I am interested." As shown in Figure 1 (Q2), 97% of the participants responded to the question "Were the contents of the course interesting?" with "They were very interesting" or "They were interesting." As shown in Figure 1 (Q3), 89% of participants responded to the question "Do you want to tell the experiences you gained in this course to a close elementary school student?" with "I really want to" or "I want to." This trend is in agreement with the results of our surveys in 2005, 2006 and 2007 [5].

(2) Scientific Experiment Course for Promoting Inter-Generational Exchange

From the results of the questionnaire survey at the previous lecture about lifelong learning, it was found that the elderly people who have participated in the lecture want to convey their impressions at the lecture about scientific experiment to elementary and middle school students. However, they do not want to participate in scientific lectures targeted at elementary and middle school students as assistants for experiment. This is because they are physically weak and they are anxious over their communication skills. Then, we discussed how to operate lectures for enabling inter-generational exchange. As the first step, the lecture about scientific experiment, in which grandparents and grandchildren cooperate with one another, was held at Nonoichi Town Central Community Center on August 9, 2008. The theme is "the production of batteries using easily available materials" (see Figure 2).



Q1: Are you interested in science?
Q2: Were the contents of the course interesting?
Q3: Do you want to tell the experiences you gained in this course to a close elementary school student?

Figure 1: Post-course questionnaire survey at the lifelong learning course in the Nonoichi long life college.

Figure 2: Cooperation with grandparents and grandchildren in science experiment course.

The number of participants was 5 pairs and 13 persons. There were 6 grandparents, and their average age was 68.5. There were 7 grandchildren: 2 first graders, 1 second grader, 2 fourth graders, and 2 fifth graders. A questionnaire survey was conducted, targeting the 6 grandparents. To Question 1: "Do you communicate with your grandchildren on a daily basis?," all answered, "I do very good or good communication." To Question 2: "Do you talk with your grandchildren about science?," three respondents answered, "I do so a little," and the other three answered, "I rarely do so." To Question 3: "Do you have a willingness to conduct today's experiment together with children?," four respondents answered, "I have a slight willingness to do so," and the other two answered, "I do not have such a willingness." Judging from the answers to Question 3 and the freely-written answers (e.g. I have a willingness, if a lecturer supervises me), almost all seem to have a willingness to participate in experiment through inter-generational exchange. Therefore, if experiment contents are good, people of different generations can communicate with one another and share impressions through scientific experiment. We should continue this survey, and discuss the contents of scientific experiment for actualizing inter-generational exchange.

(3) Comfort Activities at Welfare Facilities for the Elderly

We visited welfare facilities where elderly people live together, and conducted comfort activities under the theme of science. At such facilities, elderly people live in a group, but they tend to decrease interaction with surrounding people. Therefore, such facilities plan some events for learning and leisure, so that occupants can lead a lively life. Then, we decided to hold a show using commercially available entertainment robots.

We held classes at two welfare facilities for the aged with different functions. One is a nursing home for communal living of dementia patients; this type of facilities is aimed at not only caring for dementia patients but also retarding the progress of dementia through communal living with caring staff. The other type is the healthcare facilities for the aged, which is aimed at offering functional training and health management, etc. through the assistance in bathing, egestion, and eating, etc., consultation, support, rehabilitation, and medical treatment [6].

On October 31, 2008, we visited "Hohoemi Home (located in Hakusan-shi, Ishikawa Prefecture)," a nursing home for communal living of dementia patients. In this facility, 9 occupants live together. Figure 3-a shows a scene in which occupants see Sony's dog robot "Aibo" dancing on a makeshift stage. One occupant, who tends to avoid communicating with others, took the rhythm with the robot. This scene was witnessed by the nursing home staff, and the staff expected the possibility of the physical or mental effects of the use of such a robot. Then, on December 23, 2008, we visited "Fukuhisa Care Center (located in Kanazawa-shi, Ishikawa Prefecture)," a healthcare facility for the aged. This is a Christmas event (see Figure 3-b). At this facility, too, some occupants took the rhythm using their whole bodies, like the above case. This facility offers classes in calligraphy, etc. for assisting occupants in leading a lively life. The facility staff mentioned that the use of robots is expected to exert the same effects as the classes.

Conclusion

Here we have reported on the practical application of science experiment courses for the elderly. We can assess from the questionnaire survey we carried out at Nonoichi Long Life College that we met the participants' expectations. Additionally, at the science experiment course carried out in cooperation with grandparents and their grandchildren, we were able to get the impression that it is possible for members of different generations to communicate through science experiments. Then we held classes at the welfare facility by using entertainment robots. It seem that we need to design contents for entertainment robots while considering the physical and mental conditions of elderly people.

Figure 3: A event of entertainment robots in welfare facilities.

a: Hohoemi Home, Hakusan-shi, Ishikawa Prefecture, Japan

b: Fukuhisa Care Canter, Kanazawa-shi, Ishikawa Prefecture, Japan

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