History and activities of the Research Committee on Education in Acoustics in ASJ

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Abstract: In the Acoustical Society of Japan (ASJ), the Research Committee on Education in Acoustics was established in 1997. Although its history is relatively short in comparison with the Administrative Committee on Education in Acoustics in the Acoustical Society of America (ASA), many activities have been steadily carried out. For example, surveys of syllabi (educational plans of subjects in universities) were made. Demonstration tools used in university classes were also surveyed. The extent of our research was not limited to only universities. Textbooks and teaching materials used in elementary schools, junior high schools, and senior high schools were also researched. Furthermore, activities in cooperation with the National Museum of Nature and Science in Japan have been taking place, including an exhibition and a class with acoustic demonstrations and handicrafts for children. We believe that such activities are very important as social contributions of an academic society. In this review, some of our activities, our discussions, and the like will be introduced.

Keywords: Acoustics education, Research Committee on Education in Acoustics

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1. INTRODUCTION

In the Acoustical Society of Japan (ASJ), at present, we have nine technical committees and eight research committees [1]. The committee on acoustics education was set up in 1997 as a research committee under the chairship of Dr. Masaru Koyasu. The aim was to organize and propose our thoughts on the ideal situation for acoustics education in the future and the roles of our academic society. To concern ourselves with education as an academic society is a very fundamental issue as a matter of course, and such opinions and articles could be found in the journal of our society before the establishment of the committee. In this paper, the history and various activities are introduced.

As regards our position in this committee, Takayuki Arai was the fourth chair of the committee (from Japanese academic years 2005 to 2010), Fumiaki Satoh was the fifth chair (from Japanese academic years 2011 to 2014), and Akira Nishimura is the current chair (from Japanese academic year 2015). Table 1 shows the successive chair, vice-chair, and secretaries. In this table, each term is defined as the period when the chairperson served the committee.

2. PRE-ESTABLISHMENT

In 1978, the ASA and ASJ First Joint Meeting was held in Hawaii. The Acoustical Society of America (ASA) already had a committee on acoustics education as an administrative committee at that time and planned a panel discussion on “Education in Acoustics.” It had two parts (Panel I: Assessment of Current Status and Panel II: Projection of Future Requirements). Dr. M. Koyasu, who was the first chair of our committee as mentioned before, left descriptions in his article [2]. When ASA asked about the panel discussion, ASJ responded urgently. I strongly recognized the importance and the necessity of the roles that our society should play in education.

An article titled “Current status of education in acoustics” by Otoichi Kitamura can be found in the Journal of ASJ in 1983 [3]. In the last part of the article, the necessity of the committee is described.
In 1987, the special issue titled ‘Education in acoustics’ was published twice. In the issues, the state of acoustics education in foreign and domestic universities was introduced [4,5].

In 1997, 10 years later, the International Symposium on Simulation, Visualization and Auralization for Acoustic Research and Education (ASVA97) was held in Japan. It was one of the special events commemorating the 60th anniversary of ASJ and the 20th anniversary of the Institute of Noise Control Engineering of Japan (INCE/J). In the title of the symposium, there is the word ‘Education,’ and in the greeting statement in the proceedings [6], the statement: “the symposium should cover education” was also given. At that time, the president of INCE/J was Dr. M. Koyasu.

3. SET UP OF THE COMMITTEE

Just after the symposium of ASVA97, our committee was launched. The success of the symposium must have been one of the triggers. The scope of the committee was widely set. It was not limited to only university students, graduate students, and recruited company employees. A very active discussion was exchanged at the first meeting, in which opinions such as “We should cover elementary education to lifetime education” were dominant.

4. ACTIVITY

Table 2 shows a summary of the timelines of our activities after the establishment of the committee.

### 4.1. Survey of Syllabus

In Japan, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) directs universities to make a syllabus, that contains educational plans of subjects, summaries of every lecture, textbooks, evaluation, and the like [7]. Almost all universities have done this since 1991. Thus, the syllabi were surveyed. Keywords regarding acoustics and textbooks were collected from syllabi in each major (the field of electronics including signal processing, information science, and speech science, the field of mechanics, the field of architecture, and the field of music). The results were reported in the Journal of ASJ in 1999 and 2009 [8,9].

### 4.2. Research for from Elementary Schools to Senior High Schools

MEXT creates Courses of Study [10] for elementary schools, junior high schools and senior high schools, and all textbooks are screened in accordance with them. The topic of “Sound” was deleted from the Course of Study for elementary schools (announced in 1998) and moved to the Course of Study for junior high schools. We took this very seriously and textbooks and teaching materials used in elementary schools, junior high schools, and senior high schools were researched [11]. At the same time, exhibits on acoustics in science museums were also researched [12]. Furthermore, we contacted a company and a voluntary group: Gakken (Gakken Holdings Co., Ltd.), who has been handling educational materials for a very long time to encourage children to be interested in science and technology [13,14], and “Stray Cats,” whose members consist of physics teachers at senior high schools, respectively. Stray Cats has been proposing many exciting demonstrations to support students’ learning processes [15–18].

### 4.3. With NMNS/J

Two activities in cooperation with the National Museum of Nature and Science in Japan (NMNS/J) have been taking place. One of these activities is participating in “Summer-Holiday Science Square” hosted by NMNS/J. This is planned with the following purport: “During the summer holiday, children experience the fun of science firsthand, through a wide range of activities centered on experimentation, observation, and building [19].” The contents introduced in our exhibition booth include “Glass Harps,” “Bottle Flutes (bottles of several sizes),” “Amplification using a Plastic Noodle Cup,” “Chladni Figure,” “Girigiri-Garigari (a toy with a propeller rotated by...
vibration) [20,21],” and “Voiceprint Analysis and Digital Pattern Playback [22–24].” We have participated since 2007, and our booth is filled with children every summer [25,26]. As the other contribution to NMNS/J, we opened “Sound Lab. [19]” with NMNS/J. This is a small class with acoustic demonstrations and handicrafts for children. We have held the event since 2006. The titles of the past “Sound Labs.” have been “Let’s make a vocal-tract model [27–29]” and “Let’s make a loudspeaker.”

4.4. International Conferences

We have organized/co-organized some sessions on “Education in Acoustics” at several international conferences. Please browse the programs of “Forum Acusticum 2002 in Seville,” “ICA 2004 in Kyoto,” “Fourth Joint Meeting of ASA and ASJ 2006 in Hawaii,” and “ICA 2013 in Montreal.” At the conferences in Kyoto, Hawaii, and Montreal, demonstration sessions were added to regular oral sessions.

4.5. Domestic Conferences

ASJ has biannual national meetings in spring and autumn. The technical/research committees can propose special sessions at the biannual meetings. We have held the

<table>
<thead>
<tr>
<th>Term</th>
<th>Activity</th>
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<tr>
<td>II 1999–2000</td>
<td>✓ “Textbooks and teaching materials used in elementary schools, junior high schools and senior high schools”: The research starts.</td>
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<tr>
<td>IV 2005–2010</td>
<td>✓ “Special Issue—Introduction to the amazing world of sounds with demonstrations—”; Acoustical Science and Technology (English Journal of ASJ) is published. (2006.11)</td>
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They were occasionally held as a symposium, a demonstration session, or a panel discussion.

Furthermore, each technical committee has a monthly workshop (a scientific meeting with paper presentations) with the research committees holding them occasionally. Our committee has held workshops approximately once per year.

### 4.6. Special Issues of our Journal

As you can see in Table 2, we have incubated special issues of the Journal of ASJ including Acoustical Science and Technology, which is our English journal edited by ASJ.

In addition, a serialized article entitled “Exhibits and demonstrations on acoustics in science museums” was presented, in which various Japanese/foreign museums and exhibitions were introduced by our members or contributors. It was featured bimonthly from December 2006 to December 2010, and has been archived on our web site (in Japanese) [30].

### 4.7. Interchange with Dissimilar Fields

In the Spring Meetings in 2012 and 2014, we invited lectures [31,32] by professors who are active in the Phonetic Society of Japan [33] and in their education field. Thus, the first step of the interchange with dissimilar fields has been taken. At “Summer-Holiday Science Square” in 2014 and 2015, collaboration with the Phonetics Promotion Committee of the Phonetic Society of Japan was realized.

### 4.8. Papers on Education

Since around 2012, increasing the number of contributed papers related to education in our journals has been a hot topic. In the special session held in the Spring Meeting in 2013, the invited paper “Methods of research on educational technology and points of view for submissions to Journal” by Dr. Yasutaka Shimizu was presented [34]. He was former president of the academic society, “Japan Society for Educational Technology,” and also the chief editor of their journal. After many discussions, the contributor’s guide of our journals was revised. Now, the word “Education” is present in the “Guide for Contributors” for the Journals of ASJ and Acoustical Science and Technology. In May 2014, a special issue featuring articles on “Education in Acoustics” was published. It was a Japanese edition, but it leads to this edition in English.

### 5. PROSPECTS

Our committee members share the key phrase “Steady and Long.” As matters regarding education are very simple compared with those of research, such as new technology, this key phrase appears to be appropriate. We have another key word “Widely.” We widely interpret the extent of “Education in Acoustics,” which involves “Education using Acoustics” and “Education through Acoustics” in addition to “Education of Acoustics.” After the establishment of the committee, key phrases that frequently arise in our discussion are “Lifetime Education,” “Cultivation of Aesthetic Sentiments,” and “Social Contribution.” They are also symbolic examples of the concept of “Widely.”
Finally, our authors desire that the position of our committee will change from a research committee to an administrative committee such as ASA.

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REFERENCES