The Diversifying Media Environment of Japanese Classrooms and Educational Content
From the 2012 School Broadcast Utilization Survey

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After contributing to the writing of this article in June 2013, Seiji Watanabe was transferred to NHK’s Youth and Education Programs Division.
On April 1, 2012, the shift from analog to digital terrestrial broadcasting was completed throughout Japan, including the three Tohoku prefectures of Iwate, Miyagi, and Fukushima for which the shift had been postponed because of the severe damage suffered in the wake of the Great East Japan Earthquake of March 2011. Smartphones and tablet personal computers, which only recently appeared as highly versatile and convenient mobile tools, are quickly becoming part of people’s daily lives. With the whole world going digital, the impact on the schools where children learn, too, is considerable. A major objective described in “The Vision for ICT in Education: Toward the Creation of a Learning System and Schools Suitable for the 21st Century,” which the Ministry of Education, Culture, Sports, Science and Technology (MEXT) announced in 2011, is that by the academic year of 2020 each student in all elementary and lower secondary (junior high) schools in Japan will have had use of a tablet personal computer and “digital textbooks for learners,” the electronic versions of printed textbooks.¹ In this vision students are shown studying with a tablet PC in hand in a classroom equipped with a large interactive whiteboard. In the Future School Promotion project launched by the Ministry of Internal Affairs and Communications in 2010 and the School Innovation project launched by the MEXT in 2011, empirical research is being conducted at pilot schools throughout Japan utilizing information and communication technologies (ICT) for both hardware and software.

While the media environment surrounding the schools is undergoing drastic changes, new national Courses of Study began to be implemented at elementary schools in 2011, at lower secondary schools in 2012, and at upper secondary schools in 2013. A shift from a “more relaxed education” (yutori kyoiku) to enhancement of the content of education and an increase in the number of classes is emerging as the result. Active use of ICT in education is now being promoted, but what will be the harvest of ICT in school education from now on?

To get a better grasp of the media environment and media use in schools across the country, the NHK Broadcasting Culture Research Institute, the survey and research affiliate of NHK itself, has conducted the NHK School Broadcast Utilization Survey on a regular basis since 1950 (every two years starting in 1990).²

¹ For details of “The Vision for ICT in Education,” see http://www.mext.go.jp/b_menu/houdou/23/04/_icsFiles/afieldfile/2012/08/03/1305484_14_1.pdf
² Covering kindergartens, daycare centers, elementary schools and lower and upper secondary schools nationwide, the survey looks at and monitors changes in the dissemination and utilization of various media (radio, television, video, computers, and so on) and teachers’ attitudes toward and expectations of broadcasting and media in the classroom. Although the survey title still refers to “school broadcast” use, in fact some elements of the survey have been adapted beyond that category to reflect the changing times. Since 2000, for example, the survey
This paper analyzes the results of the 2012 survey for elementary and lower and upper secondary schools from the following four points of view: 1) diversification of the media environment of classrooms; 2) characteristics of NHK school broadcast utilization and changes in content of utilization; 3) use of varied NHK educational services; and 4) “digital textbooks,” whose use has just begun, and their future prospects. Through a better understanding of the circumstances of school education, now making the transition to major changes in both the media environment and the content of learning, this paper explores the potential of media use in school classrooms.3

Figure 1. Outline of 2012 NHK School Broadcast Utilization Survey

Survey period: September 1 (Sat.) to November 30 (Fri.), 2012
Survey method: Questionaire survey delivered by mail, with two reminders
Sample: Random sampling from Zenkoku gakkou soran, 2012 nen-ban [Comprehensive List of All Schools in Japan, 2012] (Hara Shobo, 2012). In the three prefectures of Iwate, Miyagi, and Fukushima that had been heavily affected by the Great East Japan Earthquake, schools that, after the disaster, were holding classes in temporary structures or at other nearby schools, were excluded from the survey.

Composition of sample and number and rate of valid responses, by school type

<table>
<thead>
<tr>
<th>School type</th>
<th>Total number of schools</th>
<th>Sampling rate</th>
<th>Number of sample</th>
<th>Number of valid responses</th>
<th>Rate of valid responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary schools</td>
<td>21,364</td>
<td>1/17</td>
<td>1,257</td>
<td>844</td>
<td>67.1</td>
</tr>
<tr>
<td>Lower secondary schools</td>
<td>10,640</td>
<td>1/17</td>
<td>626</td>
<td>421</td>
<td>67.3</td>
</tr>
<tr>
<td>Upper secondary schools</td>
<td>4,881</td>
<td>1/8</td>
<td>610</td>
<td>449</td>
<td>73.6</td>
</tr>
</tbody>
</table>

has included new questions about the spread and utilization of computers, the Internet, and other ICT; about the awareness and utilization of the NHK Digital Curriculum; and about use of NHK educational services provided by means other than broadcasting and the Internet.

3 For recent results of the NHK School Broadcast Utilization surveys, see the References. As for the recent trends of educational broadcasting services and beyond in Japan and other countries, see Kodaira 2009b and Kodaira 2011.
I. DIVERSIFICATION OF THE MEDIA ENVIRONMENT OF CLASSROOMS

This survey, made after the nationwide complete shift to digital terrestrial television, shows that 9 out of every 10 schools at all three levels have the capability to view digital terrestrial broadcasts (DTB) with a digital television set or some other device. That is a significant increase compared with the previous survey (2010), which found that 7 out of 10 schools had that capability for each level of school (Figure 2). Although not as great as that increase, the proportion of schools with DTB viewing capability with a digital video recorder such as a Blu-ray Disc recorder also showed a significant increase.

Figure 2. Schools with DTB Viewing Capability

![Figure 2. Schools with DTB Viewing Capability](image)

(100% = all schools surveyed)

Note 1: Viewing DTB here does not include viewing One-Seg broadcasts via mobile phone or other device.

Note 2: “DTB recording/viewing capability” includes cases in which a receiver set for DTB has a built-in recorder or a video recorder is connected to a receiver set.

Note 3: "Figures with the mark of △ (increase) or ▼ (decrease) indicate a significant difference with a reliability level of 95 percent. "

4
Progress in Digitization in the Schools

As of 2010, both analog and digital broadcasts were viewed in schools, and even those schools that could not view digital terrestrial broadcasts could watch television broadcasts on an analog-type television. It was feared that many schools might be unable to view television itself because analog broadcasts would no longer be available in the wake of the complete shift to digital terrestrial broadcasting. As it turned out, schools coped smoothly with the shift to digital broadcasting. This smooth transition was made possible not just because of the purposes of broadcast utilization at schools. Through the experience of the Great East Japan Earthquake, the importance of schools as a place of refuge to protect the lives of local residents in case of a disaster was recognized anew, and the necessity of being able to view digital terrestrial broadcasts at the schools in case of disaster or other emergency was another big factor behind the smooth transition to digital broadcasting. This is evident from the finding in the survey showing that there has been a considerable increase in the number of schools, at each of the three levels, that have a staff room (teachers’ room, principal’s office, etc.) where DTB can be viewed (Figure 3).

Figure 3. Places Where Digital Terrestrial Broadcasts Can Be Viewed

(100% = all schools surveyed)

<table>
<thead>
<tr>
<th></th>
<th>All regular classrooms</th>
<th>Some regular classrooms</th>
<th>Special classrooms*</th>
<th>Staff room**</th>
<th>In regular classrooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary schools</td>
<td>△59.0% (46.0)</td>
<td>11.3 (9.3)</td>
<td>30.3 (31.4)</td>
<td>△52.1 (31.3)</td>
<td>△70.3 (54.8)</td>
</tr>
<tr>
<td>Lower secondary schools</td>
<td>26.1 (27.9)</td>
<td>11.6 (8.1)</td>
<td>29.0 (34.4)</td>
<td>△65.3 (32.5)</td>
<td>37.8 (35.5)</td>
</tr>
<tr>
<td>Upper secondary schools</td>
<td>3.1 (2.3)</td>
<td>3.6 (2.1)</td>
<td>49.4 (45.2)</td>
<td>△74.6 (46.5)</td>
<td>6.7 (4.3)</td>
</tr>
</tbody>
</table>

Note 1: Figures in parentheses are for 2010.
Note 2: “Special classrooms”* includes the science lab room, music room, computer classroom, etc.
“Staff room”** refers to the teachers’ room, the principal’s office, class preparation room, etc.
Note 3: Figures with the mark of △ (increase) or ▼ (decrease) indicate a significant difference with a reliability level of 95 percent.
Next let us look at Internet use via personal computer. Schools with access to the Internet increased in number during the latter half of the 1990s and the early 2000s (Figure 4). Today the diffusion of Internet-connected computers has reached the highest rate at schools at each of the three levels, showing almost no further increase.

**Figure 4. Spread of Internet-connected Computers in Classrooms (Elementary Schools)**

(100% = all elementary schools surveyed)

Note 1: “Regular classrooms” here means “rate of schools with regular classrooms equipped with Internet-connected computers,” not rate of spread of Internet-connected PCs among all regular classrooms. The same goes for other kinds of classrooms. “Special classrooms” refers to science rooms and music rooms, and does not include computer rooms.

Note 2: The figures in parentheses indicate the average number of computers per school among schools with Internet-connected computers in regular classrooms.
Regarding the Internet environment, the 2012 survey shows a major change in the type of line used for access to the Internet. The proportion of schools using a fiber-optic line has significantly increased at all three levels. Such schools make up more than half for both elementary and lower-secondary schools and more than 70 percent for upper-secondary schools (up from 44.5 percent to 50.2 percent for elementary schools, up from 47.3 percent to 54.4 percent for lower secondary schools, and up from 62.5 percent to 73.5 percent). This means that the video-viewing environment has improved. The increase at least of fiber-optic line users indicates a rise in the number of schools with the capability to view videos via the Internet.

In this way, a look at schools as a whole shows steady improvement in the environment for both broadcast and Internet utilization. To see if such utilization is really easier than before, let us observe the situation in elementary school “regular classrooms,” the center stage for classroom work.

Digital Media Environment Still Limited in Elementary School Classrooms

Of all elementary schools surveyed, 92.9 percent have the capability to view DTB and 99.8 percent have access to the Internet. Meanwhile, 70.3 percent have the capability to view DTB in regular classrooms and 66.4 percent have access to the Internet in classrooms. In using the Internet, an interactive whiteboard⁴, which can display and enlarge images on a computer screen, is a very convenient device of displaying videos and other images on a large screen. The survey shows that 70.7 percent of schools have regular classrooms equipped with interactive whiteboards (Figure 5). Seven out of ten elementary schools can now use an interactive whiteboard in their regular classrooms.

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⁴ Interactive whiteboards used at schools include several types, including whiteboard with a projector built in, whiteboard with images projected on it with a projector, and whiteboard that is mounted on a conventional blackboard to display images projected on it with a projector. “Schools with an interactive whiteboard” indicates schools with one of these types.
The proportion of schools where regular classrooms have access to both DTB and the Internet and also have an interactive whiteboard is still low, at 38.0 percent, despite a significant increase from 26.4 percent in the previous survey. “When you want to make use of DTB, the Internet, or an interactive whiteboard you can use them any time”—that most desirable environment will be realized only when all the three are
available in regular classrooms. Schools with such an environment remain of limited number.

In other words, in regular classrooms some schools have access to both DTB and the Internet, others have access to DTB but not to the Internet, or vice versa, and there are still other schools that can use neither DTB nor the Internet. The media environment for regular classrooms varies from school to school.

The “School New Deal” initiative the government adopted in 2009, aiming to equip schools for the twenty-first century, provided the impetus to improve the media environment in schools throughout the country. Not all schools, however, have easy access to digital media in regular classrooms at the point of this writing.

II. CHARACTERISTICS OF NHK SCHOOL BROADCAST UTILIZATION AND CHANGES IN CONTENT

A look back over the history of NHK school broadcasting shows that schools that utilized school broadcast programs via television increased in number since the start of television broadcasting in 1953 in parallel with the acquisition of television sets and video tape recorders in schools (Figure 6).

School Broadcasting Services via Television and the Internet
The 1990s was the era when personal computers and the Internet came to be used even in the classroom, and in 2001 the NHK Digital Curriculum was launched, providing video and interactive-learning teaching resources linked to school broadcast programs. Today the resources correspond to all the school broadcast programs targeting elementary school through lower and upper secondary school. “NHK for School” is the portal site for access to all NHK educational services for schools.
Figure 6. Fluctuations in the Media Diffusion and School Broadcast Utilization Rates for Elementary Schools

(100% = all schools surveyed)

Note 1: For the first ten years of the NHK school broadcast utilization survey, each school type was surveyed separately. Simultaneous surveys of radio and TV utilization at all school levels from kindergarten to upper secondary school began in 1961.

Note 2: From 1967 each survey was carried out from September to November. For each of the surveys conducted from 1962 to 1966, a sample of school broadcast-utilizing school was selected through a sampling survey of all schools that was carried out in June, and the circumstances and trends of program utilization for that sample were surveyed from September to October.

Note 3: For each survey from 1973 on, the surveyed schools were given a list of all NHK school broadcast programs being broadcast at the time of the survey and were asked to indicate for each program whether or not they utilized it. Every school with at least one class that utilized at least one program on the list was designated an “NHK school broadcast-utilizing school,” and the ratio of such schools to the total number of schools surveyed was calculated as the “NHK school broadcast utilization rate.”

Note 4: The “NHK Digital Curriculum utilization rate” is the rate of use of NHK Digital Curriculum resources in classrooms for all schools surveyed.

Note 5: The “School DTB-viewing capability rate” is the rate of schools that view DTB with some kind of device. However, in the 2006 and 2008 surveys, only “Have/Don’t have DTB receiver” was included in the questionnaire.
Figure 7. “NHK for School”

The NHK Digital Curriculum is composed of “TV Programs” (broadcast programs), “Video Clips” (short 1- to 3-minute clips), “Activities” (quizzes and games relating to program content, activities useful for learning how to do research), and “Teachers” (sample lesson plans and worksheets that can be printed out). All are accessible at the “NHK for School” portal site.

The NHK Digital Curriculum consists of four components (“television programs,” “video clips,” “activities,” and “teachers”) for each program and all content is available free of charge. Television programs for schools (about 1,100 programs) and a collection of short video clips edited from NHK educational broadcasts (about 4,000 clips) are available. Starting in 2011, the quality of the images has been improved so that such materials can be viewed clearly on large-sized display screens such as the interactive whiteboard. With the launching of the NHK Digital Curriculum, school broadcast programs may be viewed not only on television but also on the Internet.

The NHK School Broadcast Utilization Survey has consistently kept track not only of the diffusion of digital and other equipment in Japanese schools but actual use of NHK’s school broadcast services. To gain a quantitative idea of the use of school broadcasting, we use as an index “NHK school broadcast utilization rates.” “School broadcast-utilizing schools” are defined as schools that have held classes using school broadcast programs between April and November of the year the survey was conducted.
The rate of such schools has been recorded for each level of school. Since the NHK Digital Curriculum appeared, school broadcast programs may be viewed not only by using the NHK Digital Curriculum but also in combination with the NHK Digital Curriculum’s other features such as video clips, glossaries and related links, and worksheets. To accurately grasp the state of NHK school broadcast utilization, therefore, since the 2002 survey onward, even those schools that have held classes utilizing the NHK Digital Curriculum are included in the category of “school broadcast-utilizing schools” when “NHK school broadcast utilization rates” is computed.

Figure 8 shows the “NHK school broadcast utilization rates” and the “estimated number of school broadcast-utilizing schools” reflecting the results of the 2012 survey. Compared with the 2010 survey results, there is little change for elementary schools and upper secondary schools but a significant increase for lower secondary schools. Note that more programs were available for lower secondary schools than at the time of the 2010 survey. Note also that utilization rates for lower secondary schools over the years since 2000 have fluctuated between 20 to around 30 percent, and therefore the above increase, although significant, is within that range of change.

**Figure 8. NHK School Broadcast Utilization Rates for 2012**

(100% = all kindergartens and schools surveyed)

<table>
<thead>
<tr>
<th></th>
<th>Television</th>
<th>Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Utilization rate (%)</td>
<td>Est. no. of utilizing schools</td>
</tr>
<tr>
<td>Elementary schools</td>
<td>72.0</td>
<td>15,382</td>
</tr>
<tr>
<td></td>
<td>(73.2)</td>
<td>±634</td>
</tr>
<tr>
<td>Lower secondary schools</td>
<td>△ 30.6</td>
<td>3,256</td>
</tr>
<tr>
<td></td>
<td>(21.4)</td>
<td>±459</td>
</tr>
<tr>
<td>Upper secondary schools</td>
<td>28.1</td>
<td>1,372</td>
</tr>
<tr>
<td></td>
<td>(24.5)</td>
<td>±193</td>
</tr>
</tbody>
</table>

Note 1: Figures in parentheses are those for AY 2010.
Note 2: The △▼ marks indicate significant difference compared to AY 2010 with a reliability rate of 95 percent.
**Characteristics of School Broadcast Utilization in Elementary Schools**

The 2012 survey finds that the elementary school NHK school broadcast utilization rate (hereafter “school broadcast utilization rate”) is 72.0 percent, virtually no change from the previous survey (73.2 percent). More details are shown in Figure 9.

**Figure 9. Changes in the Breakdown of the School Broadcast Utilization Rate (Elementary Schools)**

(100% = all schools surveyed)

Note: The NHK Digital Curriculum started in 2001, and the survey began to cover it in 2002. The 2002 and 2004 surveys found no “schools using the NHK Digital Curriculum only.”
Shifts in Configuration of Use in Broadcast-utilizing Schools

Before the creation of the NHK Digital Curriculum, “school broadcast utilization” referred to “utilization of school broadcast programs aired on television.” These days, the proportion of schools using the NHK Digital Curriculum in classes (i.e., using this resource either separately or in conjunction with school broadcasts) has increased, whereas the proportion of schools using school broadcast programs (i.e., schools using the program either separately or together with the NHK Digital Curriculum) has decreased. There are several factors behind this shift in the configuration of use in NHK school broadcast-utilizing schools.

One factor is that the use of the NHK Digital Curriculum has taken hold as a teaching resource always available on the Internet. The components of the NHK Digital Curriculum can be used as shown in Figure 10, and opportunities for their utilization, it can be presumed, has been increasing for various school subjects. Another factor is the rise in the proportion of schools that have access to the Internet in regular classrooms, a better environment for the use of such teaching resources.

NHK Digital Curriculum utilization remained low for some time after its launch. The 2006 survey, however, indicated the appearance of schools using it separately from school broadcasts and the 2010 survey showed it being used by more than a half of NHK school broadcast-utilizing schools (Figure 9).

On the other hand, a major factor responsible for the decline in the proportion of schools using broadcast school programs is presumably that the situation of television in regular classrooms had changed following the shift to digital terrestrial broadcasting. Presently, only 7 out of 10 schools have that capability, and as few as about 3 out of 10 schools (32.1 percent) have DTB recording/viewing capability. That is, a considerable number of schools cannot view television in regular classrooms. In that sense, the situation has not attained the level of the era of analog broadcasting when almost all regular school classrooms had a television set and could view recorded programs or broadcasts in real-time. This is related to the situation in which schools may have digital televisions installed in regular classrooms but cannot view DTB; in other words, compared to the analog era, there are more schools that find television viewing difficult in regular classrooms.
Figure 10. Nature of Use of NHK Digital Curriculum (Elementary Schools)

(100% = all schools surveyed)

While utilization of school broadcast programs has been on the decline, schools that view such programs on large-screen digital television in a classroom have high praise for the clear picture quality provided by digital terrestrial broadcasting. Drawing on such images that cannot be provided through textbooks or reference materials, teachers have access to broader resources that can more effectively appeal to children’s sensibilities than in the analog era. What we should keep in mind is that use of broadcast programs as teaching resource content, is not necessarily on the decrease. As Figure 9 indicates, the NHK Digital Curriculum is frequently used to view broadcast programs on the Internet as well as video clips. The “NHK Digital Curriculum utilization” in Figure 9 includes viewing broadcast programs on the Internet. We can say, therefore, that because it has become possible to view broadcast programs via the Internet the utilization of broadcast programs via “broadcasting” is decreasing, but broadcast programs continue to be frequently viewed, now as teaching resource content.
Mode of Broadcast Utilization Varies According to Classroom Media Environment

The previous section discussed the major features of school broadcast utilization in elementary schools, but the mode of such utilization greatly varies depending on the media environment of regular classrooms. Figure 11 shows regular classroom DTB viewing capability or lack thereof, DTB recording/viewing capability or lack thereof, and access/no access to the Internet, as well as how such media environment is related to the mode of school broadcast utilization.

Figure 11. Regular Classroom Media Environment and Its Relation to School Broadcast Utilization (Elementary Schools)

(100% = all schools surveyed)

* For row I “DTB viewing ○,” “DTB receiving/viewing ○,” and “Access to the Internet ○” indicate schools that have “DTB viewing capability,” “DTB receiving/viewing capability,” and “Internet access capability” in regular classrooms, respectively. ○ indicates “capable,” and × “lacking capability.” The same applies to rows II through V. For “Access to the Internet,” ○ and × indicate whether or not the regular classroom has computers connected to the Internet.
I, II, and III all have a high rate of school broadcast utilization, at around 80 percent, compared with the average of 72.0 percent for all the elementary schools surveyed. They differ in the breakdown of utilization rates, however. Schools that have not only DTB viewing capability but also DTB recording/viewing capability most actively utilize school broadcast programs (I and II), whereas schools that do not have DTB receiving/viewing capability but have access to the Internet most actively utilize the NHK Digital Curriculum (III). In other words, broadcast programs can be viewed by those with recording/viewing capability; even without recording/viewing capability, broadcast programs can still be viewed via the NHK Digital Curriculum if access to the Internet is available. An environment providing recording/viewing capability and in which broadcast programs can be viewed on the Internet at any time is linked to a high rate of school broadcast utilization.

On the other hand, the school broadcast utilization rate is low, at around 60 percent, for both schools with DTB viewing capability only and schools with Internet access only in regular classrooms (IV and V). The former are active in utilizing school broadcast programs but not very active in utilizing the NHK Digital Curriculum, and vice versa for the latter. In these schools, students probably move to a special room such as a computer room to use media not available in a regular classroom. As these survey results suggest, school broadcast utilization is lower if such media are not available in regular classrooms—the places where students usually study.

The situation has greatly changed from the days when only television broadcasts could be viewed. With the NHK Digital Curriculum now available on the Internet, school broadcast utilization has become quite diverse, combining broadcasting with Internet use. The diversified media environment in regular classrooms, it can be said, encourages diverse utilization in accordance with the environment.

**Individual Programs: Science and Social Studies Programs More Favored**

A look at the situation of school broadcast utilization for 2012 in terms of individual programs shows that all of the four most favored programs were science-related (Figure 12). Two social studies programs for the upper grades of elementary schools were also viewed by many schools. All were launched either in 2011 or 2012 after the length of time for school broadcasts was shortened to ten minutes. A breakdown of utilization reveals that the NHK Digital Curriculum is more often utilized than “school broadcast programs” to view these programs.

Since the advent of the era of television as the dominant media, science and social studies programs have been actively utilized because they deal with experiments,
natural phenomena, current events in various parts of the country, historical documents and artifacts, and the like, which are difficult to present in the classroom by other means. Today, not only television broadcast programs but video clips in the NHK Digital Curriculum are also available, increasing the utilization of science and social studies programs.

Figure 12. School Broadcast Programs Most Frequently Used by Elementary Schools

<table>
<thead>
<tr>
<th>Program utilization rate (%)</th>
<th>NHK Digital Curriculum utilization rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fushigi ga ippai (Wonder Everywhere) (5th grade: science)</td>
<td>42.1</td>
</tr>
<tr>
<td>Fushigi ga ippai (Wonder Everywhere) (6th grade: science)</td>
<td>41.4</td>
</tr>
<tr>
<td>Fushigi ga ippai (Wonder Everywhere) (4th grade: science)</td>
<td>36.6</td>
</tr>
<tr>
<td>Fushigi ga ippai (Wonder Everywhere) (3rd grade: science)</td>
<td>34.2</td>
</tr>
<tr>
<td>Zawazawa mori no Ganko-chan (Rockis and Her Friends) (1st &amp; 2nd grade: morals)</td>
<td>31.9</td>
</tr>
<tr>
<td>Shakai no tobira (5th grade: science)</td>
<td>28.7</td>
</tr>
<tr>
<td>Rekishi ni dokiri (6th grade: science)</td>
<td>20.1</td>
</tr>
</tbody>
</table>

Note: “Program utilization rate” is the rate of schools using specific programs in class either as school broadcast programs and/or as NHK Digital Curriculum resources. The “NHK Digital curriculum utilization rate” is the rate of schools using Curriculum resources for specific programs in class.
III. USE OF DIVERSE EDUCATIONAL SERVICES FOR SCHOOLS

Other than school broadcast programs and the NHK Digital Curriculum, NHK provides various educational services, including events for students and teachers and making available programs and videos from its archives.

Educational Events for Students and Teachers
NHK holds diverse educational events for participation not just by students but teachers and gain experiences. For students these events go beyond classroom learning and help to foster personal growth; for teachers they offer the opportunity to acquire new education-related information and share their experience. Information about these educational events is available at the “NHK for School” portal site.

The most favored of the events aimed at students are the NHK All-Japan Music Competition (used by 3.8 percent of elementary schools, 14.5 percent of lower secondary schools, and 11.4 percent of upper secondary schools), the NHK Award: All-Japan Broadcasting Contest (5.7 percent of lower secondary schools and 29.8 percent of upper-secondary schools), and the “Kimi ga Shuyaku da!: NHK Hoso Taiken Kurabu” (You Take the Lead! The NHK Broadcasting Experience Club), an event for elementary school upper-grade students (3.6 percent of elementary schools).

The music competition was launched in 1932 as a chorus contest and the broadcasting contest (a competition for best results of student broadcasting activities) was launched in 1954, and so both have a long history. The “Broadcasting Experience Club” event gives children a chance to experience a broadcaster’s work and role by, for example, taking part in the production of a model news story. From its launch in 2000 up to 2012 a total of more than 12,000 elementary schools from across the country have participated. As features peculiar to broadcaster-sponsored events, the music competition and its participants’ choruses, works presented at the broadcasting contest, the model newscasts produced by elementary school students at the “Broadcasting Experience Club,” and so forth are widely broadcast and transmitted online.

The “Sensei no Tame no Dejitaru Terebi ICT Katsuyo Koza” (Lectures for Teachers on How to Utilize Digital Television and ICT) has now taken root as an event aimed at teachers. As a traveling workshop for learning how to create lesson plans using the NHK Digital Curriculum and ICT (information and communication technology) resources, it has been held annually at ten different locations around Japan since 2002. There, teachers gather in one place, utilizing ICT resources and experiencing model classes together, as well as acquiring new and useful ways of teaching through exchange
of information with other teachers. Over the ten years since its start, these workshops have been held in all the prefectures in Japan.

New Services, the “NHK Teacher’s Library” and the “NHK Creative Library”
In 2009 the NHK Teacher’s Library and the NHK Creative Library were launched as services designed to make the radio and television programs and audio visual materials preserved in the NHK Archives widely available for use in school education. The NHK Teacher’s Library ([http://www.nhk.or.jp/archives/teachers-l/](http://www.nhk.or.jp/archives/teachers-l/)) loans out high-quality DVDs of school broadcast programs, NHK Specials, and other NHK programs free of charge (users pay shipping fees only). Users can choose programs from eight genres including “environment,” “peace,” “disaster prevention,” and “information.” The NHK Creative Library ([http://www.nhk.or.jp/creative/](http://www.nhk.or.jp/creative/)) provides free of charge about 4,600 items (images for which NHK holds the copyright, as well as music, sound effects, etc.) under categories such as “Living Things,” “Landscapes of Japan and the World,” and the “The Earth and the Environment.” Students can download these items, edit them and combine them with other images or photographs to create assigned projects.

Both these services are new and NHK is still at the stage of promoting their use in schools. The proportion of schools responding to the survey that they wanted to use the services shows a significant increase for schools at all levels in the 2012 survey compared with the previous survey, indicating schools’ strong interest in the new services. The NHK Teacher’s Library and the NHK Creative Library are expected to be utilized widely, with the former as a new service to provide broadcast programs in classes and the latter as a service that helps to enhance students’ video literacy.

Overview of Utilization of NHK Educational Services
Above we looked at utilization of the school broadcast programs, the NHK Digital Curriculum, and the educational events NHK provides. Now let us look at the overall picture of utilization of NHK educational services, which can be organized in the following three categories:

(a) NHK broadcast programs and the NHK Digital Curriculum: School broadcasts, the NHK Digital Curriculum, and NHK programs for general audiences (such as “NHK Specials”) for classroom use.
(b) Commercially released videos and DVDs of NHK programs: Commercially supplied videos and DVDs made from school broadcast programs and NHK programs for general audiences of various kinds.

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NHK Educational events: Educational events and services provided by NHK for students as well as teachers.

The proportion of schools that utilize educational services in at least one of these three categories is 82.7 percent among elementary schools, 69.6 percent for lower secondary schools, and 71.9 percent for upper secondary schools. Figure 13 shows how the uses of these three categories of services overlap.

Figure 13. Overview of Utilization of NHK Educational Services

(100% = all schools surveyed)

Of the three categories, it is “NHK broadcast programs and the NHK Digital Curriculum” that carries the greatest weight at schools of each level. A closer look shows that elementary schools overwhelmingly utilize school broadcast programs and the NHK Digital Curriculum, whereas lower and upper secondary schools make frequent use of programs for general audiences. The “NHK Specials” (at least one “Special”) is used by 22.6 percent of lower secondary schools and 32.5 percent of upper secondary schools. Not only weekly series currently broadcast such as the “Professional: Shigoto no Ryugi” (The Professionals: Their Approach to Work) (12.1
percent for lower secondary schools, 16.0 percent for upper secondary schools) and the “Rekishi Hiwa Historia” (Little Known Episodes of History) (4.8 percent for lower secondary schools, 8.9 percent for upper secondary schools) are often used. Even weekly series that are no longer on the air, such as the “Project X” and the “Sono Toki Rekishi ga Ugoita” (History Moved at That Moment), are also still viewed by many schools using videos recorded when they were aired or commercially released videocassettes and DVDs.

Looking at how the three circles overlap in Figure 13, we see that most of the elementary schools that use “commercially released videocassettes/DVDs” and “educational events” also use “broadcast programs and the NHK Digital Curriculum,” hence the overlap is quite large. Among lower and upper secondary schools there are quite a few that use either commercially released videocassettes/DVDs only or educational events only. In this way, the use of NHK educational services differs by school level.

So far we have looked at how the media environment in schools has changed after the complete shift to digital broadcasting and how NHK’s educational services are being utilized in that new environment. The 2012 survey shows that many Japanese schools use broadcast programs, digital resources, and other NHK educational services, which thus play an important role in school education. In the following section, let us look in detail at the utilization of the latest teaching resource, “digital textbooks.”

IV. “DIGITAL TEXTBOOKS” AND THEIR PROSPECTS

Digital textbooks can be defined as a teaching resource for computer use combining the content of conventional printed textbooks with audio and video clips, animation, etc. Digital textbooks now in practical use in Japan are made for teachers, who display the pages on a large screen in the classroom, such as an interactive whiteboard, in the course of instruction (Figure 14). Although called “textbooks,” they are not authorized, as are printed textbooks, by the education ministry (MEXT). They are just one of many teaching resources. Partly due to the national government’s promotion of ICT use in education and partly in the wake of the full implementation of the new MEXT-developed Courses of Study starting in April 2011, the textbook publishing companies began creating digital textbooks by subject that correspond to their own printed textbooks, and these digital textbooks are being sold to schools.
When you start up a “digital textbook for teachers,” the pages are displayed large on an interactive whiteboard or digital television. (Courtesy Aoyama Yuki, teacher of Elementary School, University of Tsukuba) Copyright: Mitsumura Tosho Publishing Co. Ltd.

Half of Elementary Schools Use Digital Textbooks for Teachers

The survey finds that digital textbooks for teachers are used in about a half of elementary schools, as shown in Figure 15. The new MEXT Courses of Study were implemented in stages over a three-year period, starting with elementary school, then in lower secondary schools, and finally in upper secondary schools, and the textbook publishing companies’ production of digital textbooks for teachers also started with elementary schools. The utilization rate, therefore, differs from one school level to another.

5 According to a March 2012 MEXT survey, 29.4 percent of elementary schools had digital textbooks. MEXT created its own digital textbooks for teachers for use in conjunction with elementary schools’ “foreign language activity” and distributes them free of charge to schools willing to use them. But, since MEXT does not categorize “foreign language activity” as a formal school subject, the digital textbook for use to guide such classes is not seen as a school textbook, and therefore was excluded from the MEXT survey. On the other hand, the present NHK survey includes MEXT's digital textbooks for “foreign language activity,” for we judge that it measures up to the other “digital books for teachers” in terms of both content and the way it is used.
“Digital Textbook for Teachers” Utilization Differs by Subject

The survey asks the schools using “digital textbooks for teachers” what subjects they mainly use them for. The results are given in Figure 16. “Digital textbooks” are most frequently used for “foreign language activity” in elementary schools and for “foreign language” in lower secondary schools, for about a half of user schools in both cases. The next most frequently used are for arithmetic and Japanese in elementary schools and for science in lower secondary schools.

Figure 16. School Subjects for Which “Digital Textbooks for Teachers” Are Mainly Utilized (Elementary Schools and Lower Secondary Schools)

(100% = all schools that use digital textbooks for teachers)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Elementary schools (n = 398)</th>
<th>Lower secondary schools (n = 114)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese</td>
<td>42.2</td>
<td>Japanese</td>
</tr>
<tr>
<td>Penmanship</td>
<td>16.6</td>
<td>Social studies</td>
</tr>
<tr>
<td>Social studies</td>
<td>27.6</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>45.5</td>
<td>Science</td>
</tr>
<tr>
<td>Science</td>
<td>24.1</td>
<td>Foreign language</td>
</tr>
<tr>
<td>Foreign language activity*</td>
<td>54.8</td>
<td></td>
</tr>
</tbody>
</table>

* For “Foreign language activity” see page 23
Frequent use for foreign language teaching is probably the result of “digital textbooks for teachers” having replaced such audio teaching resources as cassette tapes and CDs as aids for reading, listening, word pronunciation, etc. Viewing landscapes overseas via video clips included as part of “digital textbook” also helps to enhance students’ interest and concern. Elementary school teachers do not necessarily have a foreign language (English) teaching license, and yet they are expected to teach English. Limited help can be obtained from the government’s “assistant language teachers” (ALT) program, which sends foreign nationals throughout Japan to serve as teaching assistants in schools. For these reasons, and also in order to provide a chance to hear a native (English) speaker’s reading and pronunciation over and over, the “digital textbooks” are often used for language teaching.

Asked how they feel about using the “digital textbook for teachers,” many schools see it favorably as a teaching resource. Generally they say, “students’ attention and concentration can be increased by enlarging words and images,” they can “show video clips as the textbook’s flow unfolds,” and they find “intuitive understanding possible through animation” to be effective (Figure 17).

High marks are also given to being able to effectively use the digital textbook because it has video clips and other built-in materials for elaborating on the textbook content (28.9 percent for both elementary and lower secondary schools). For teachers, whose days at school are also busy with administrative chores, digital textbooks seem helpful not just during class but in preparing lessons. At the same time, some schools think it better not to use this digital resource for all subjects or classrooms but to use it discriminately according to students’ and teachers’ situation. This probably means that the “digital textbooks for teachers” is one of many teaching resources and that teachers who actually teach classes are encouraged to consider whether to use it or not according to their own judgment.
Figure 17. Teacher Responses on Using “Digital Textbooks for Teachers”
(Top Five Responses; Elementary Schools and Lower Secondary Schools)

(100% = all schools that use digital textbooks for teachers)

- Text, illustrations, photos, etc. in the textbook can be enlarged and displayed, which enhances students’ attention and concentration. 83.2%

- Video clips and still images are built in to go with textbook explanations, and it is very convenient to be able to replay them as the flow of the textbook unfolds. 67.1%

- Reading of the text, actual sounds, and other audio elements increase students’ interest and imagination. 44.5%

- Through animation students can intuitively understand such things as the stroke order of kanji characters and explanations of arithmetic and mathematical figures. 44.0%

- A teaching resource such as this should not be uniformly used for all classes; rather they should be discriminatingly used according to the aims of subjects and units, teachers’ abilities, students’ interest and concern. 31.7%

Different Uses of Digital Textbooks and School Broadcasts by Subject

In that “digital textbooks for teachers” provides video clips for use in science and social studies classes, they are similar to NHK school broadcast services. So, let us look at the relationships between the two in terms of their utilization in schools, with focus on elementary schools. (Note that “NHK school broadcasts” here refers to both television school broadcast programs and the NHK Digital Curriculum.)

Figure 18 charts the relations of use of NHK school broadcasts and “digital textbooks for teachers.” It shows that half of school-broadcast-utilizing schools also use “digital textbooks.” Their way of using the “digital textbooks” varies, however, from
one school subject to another. For Japanese classes, for example, “school broadcasts” and “digital textbooks” are used by about the same proportion of schools, but for science and social studies classes, a far larger proportion of schools use “school broadcasts.”

Figure 18. Relations of Use of NHK School Broadcasts and “Digital Textbooks for Teachers” in the Schools

(100% for all schools surveyed)

The reason for the variance is probably because class procedures and ways of using textbooks differ from one school subject to another. Japanese, arithmetic, and “foreign language activity,” for which the “digital textbooks for teachers” are often used, are subjects in which classes proceed more or less in accordance with the textbook. And therefore, the “digital textbooks for teachers,” which presents the text and illustrations of specific printed textbooks are in frequent use for these subjects. School broadcasts, on the other hand, are more often used for such subjects as science and social studies,
probably because they deal with experiments, natural phenomena, current events in
Japan and other parts of the world, historical documents and artifacts, and so forth,
hence their classes rely more on videos and other audiovisual materials.

In this way, use of “school broadcasts” and “digital textbooks” differs from one
subject to another. From the respondents’ comments written on the questionnaires, too,
we can see that teachers use teaching resources for classes according to their own
judgment.

The 2012 survey took up the “digital textbooks for teachers” for the first time as part
of the latest approach to the content of teaching in the schools. Teaching content has
grown more diverse with the addition of the “digital textbooks” to “NHK school
broadcasts” and conventional teaching resources. Modes of study are expected to
diversify further, as well.6 Some of the respondents’ comments may be of interest in
that context.

My classes mainly use textbooks, so I often use the “digital textbooks for
teachers.” As far as video clips, though, the NHK Digital Curriculum is better.
(elementary school)

NHK is very selective in terms of performers and content, and its ideas are often
modern and innovative, and easy to understand. The digital textbooks are still in
the developing process and are not sufficient in content. (lower secondary school)

I use different resources according to subject and content. They each have their

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6 Researchers’ interest in digital textbooks has been growing. At the 19th annual convention of
the Japan Association for Educational Media Study (August 31 and September 1, 2012), a
symposium on the near-future educational media environment and classroom practices took
place, discussing the potentials and challenges of use in schools of the new media, including
digital textbooks for teachers and for learners. (Japan Association for Educational Media Study,
ed., Dai-jukyu-kai Nihon Kyoiku Media Gakkai nenji taikai happyo ronbunshu [Collected
Papers Presented at the 19th Annual Convention of the Japan Association for Educational Media
Study], 2012). On March 23, 2013 the Japan Society for Educational Technology held a
university-industry collaborative seminar to discuss computerization of education with
representatives of industry, particularly focusing on “the future of schools from the perspective
of educational technology; learning from Asia and thinking about Japan.” At this meeting, a
researcher from KERIS (Korea Education & Research Information Service) reported on the
current school situation in Korea—where a greater progress toward “an information terminal
and a digital textbook for each and every student” is being made than in Japan—as well as about
teacher training and other challenges from now on. From the Japanese side a researcher from a
pilot school for the Japanese government’s Future School Promotion Project reported on the
school’s experience of the project over the last three years. Participants from the educational and
industrial sectors exchanged views from different perspectives about the future potentials of the
utilization in schools of information and communication technologies, such as digital textbooks.
merits. In teaching, for content that you cannot experience at school (such as movements of the stars at night, growth of plants), I find NHK easier to use. (elementary school)

Depending on the unit and the content, I use different resources. I think the learning experience will be more effective if we could access the NHK Digital Curriculum via the “digital textbooks for teachers” so that we would be able to present relevant teaching materials. (lower secondary school)

CONCLUSION

Since the turn of the twenty-first century, Japanese schools started new school years thirteen times already as of April 2013. How well are schools equipped for the twenty-first century, according to the aspirations expressed in the “School New Deal” initiative of 2009? What we learned from the 2012 NHK School Broadcast Utilization Survey, conducted for the first time since the complete shift to digital terrestrial broadcasting, is this: not all schools are capable of viewing DTB; that there are still many schools that do not have regular classrooms equipped with adequate media environment; but that even those schools that can use either DTB or the Internet are utilizing school broadcasts, thus making the best of the media they have. “Twenty-first century schools” may be envisioned as realization of “collaborative learning” in which students teach one another and learn together while manipulating “digital textbook for learners” built into each student’s tablet device, as found in the MEXT 2011 “Vision for ICT in Education.” That ideal stage is still a dream, but the survey has found that teachers now have, or are about to have, access to DTB or/and the Internet and are incorporating such access into their classes, depending on their media environment.

In the 2012 survey, as in the previous survey, the use of school broadcasts on television has decreased while the use of the NHK Digital Curriculum has increased. This does not necessarily mean a decline in the use of “broadcasts” as content, however. In classrooms that can access the Internet, broadcast programs are viewed via the NHK Digital Curriculum. It is notable that “broadcasts” themselves are still in active use in schools as effective educational content.

Educational use of a broadcast program starts by tracing how students’ thinking proceeds as they view a program and understand its storyline. All students in a classroom view the same program together and confirm each other’s various responses. Learning new things together through sharing this experience carries much significance.
today. This is something school broadcasting has cultivated over the past decades. The process of sharing starts with exchange of views and other group-oriented activity, as demonstrated by accumulated classroom practice in the history of school broadcasting. Collaborative learning is not something that starts only when each student has a tablet computer; it is something that has been done in the conventional way of learning through broadcasts. True, use of a tablet device makes it possible to visualize each other’s views and make them easier to convey, but a look at the experience accumulated so far shows that the “broadcasts” already aired provides sufficient content to contribute to collaborative learning with emphasis on students learning together.

“Broadcasts” have become more user-friendly because, in addition to viewing recorded programs, broadcasts can now be used in classes via the Internet at any time. Moreover, the length of time for almost all NHK school broadcasts has been shortened to ten minutes, probably creating more time within elementary school’s 45-minute class for post-viewing study and activity. Now there are diverse possible modes for school broadcast utilization. Some schools may view two broadcasts in one class. For example, students may view a program at the beginning of a class to increase their motivation to study and then view another program as a summary of the class. Or they may view two programs in a row to deepen their understanding of what they are studying. Of course, you can combine broadcast viewing with the use of the NHK Digital Curriculum. Educational use of digital terrestrial broadcasts started prior to the shift to digital broadcasting. Accumulation of classroom practice arising from the use of “broadcasts” following the shift to digital broadcasting has just begun. Classrooms will take advantage of not only the effect of high-definition programming but digital television with multiple functions (data broadcast, etc.), and the interactive whiteboard image-control and mark-up functions. We hope that lessons that start with viewing of “broadcasts” will spread in classrooms across the country.

In addition to DTB and the Internet, various other ICT tools have begun to appear in the classroom. Educational content, too is diverse, including the NHK Digital Curriculum. Even if their schools and classes are fully equipped with the tools and content, many teachers may be at a loss how to make best use of them. Teachers are now required to be able to make decisions on what tools and content they should, or should not, use in what situations, and to design their classes based on the characteristics of individual grade level and subjects as well as on their students’ academic skills and aptitudes. With generation-change rapidly occurring among teachers, educational services that will help to support and guide teachers will be all the more important.
On April 2013 NHK launched an “educational journal” program *Educatio!* (Latin word for education) on the NHK Educational channel. The program takes up not only topics related to education and media but also issues confronting schools such as bullying, corporeal punishment, and declining scholastic achievement. Increasing the number of such programs through which teachers can gain useful information will contribute to teacher support. Social networking among teachers with the use of social media has already been increasing, but exchange of views and information among them should not be confined to the Internet alone. Expansion of forums where face-to-face communication takes place—like the NHK-sponsored “Sensei no Tame no Dejitaru Telebi ICT Katsuyo Koza” (Lectures for Teachers on How to Utilize Digital Television and ICT)—should also be encouraged.

During the two years following the previous 2010 school broadcast utilization survey, the environment surrounding Japanese schools underwent considerable change. What is taught and how in schools has been changing according to the needs of the times and of society. With rapid advances in the media, the changes taking place in the media environment of classrooms are expected to escalate. The schools as they are now are already “twenty-first century schools” in the sense that they exist in that century. But, what should be done and how in order to move forward toward what is really required of “twenty-first century schools”? We will keep watch over the development of circumstances in the schools by conducting surveys from the point of view of the media and their educational uses. We hope that developments from now on will, above all, lead to enhancement of students’ joy of learning.

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