

Environmental education is an important basis of environmental conservation activities. Accountability has been recently noticed for public works that may affect environments, and it is now regarded as an ideal to construct public facilities by sharing knowledge and information and reaching agreement with the people involved in the work. With such a background, "communicating information" is now highly valued in Japan, where opportunities for providing information on the natural environment are increasing. The Aqua Restoration Research Center (ARRC) is investigating "exhibition" as one of its study topics; a means of transmitting organized information to a number of people at any time. This article describes information panels developed to explain river studies in an easy-to-understand manner. The panels were developed by reconsidering the fact that most exhibitions had been made only from the viewpoints of the exhibitors, and asked the visitors to examine and evaluate the panels.



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at the most appropriate sites by according to the visitors' viewpoints.

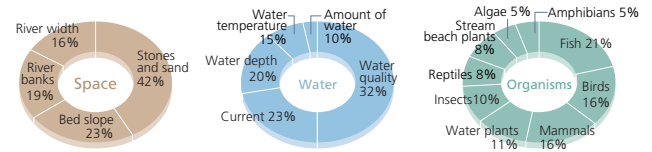
The right-hand side of each board displays detailed information in itemized sentence form in the following three sections: Study Points, Methods, and Results. Study Points gives an overview of the background, significance and objectives of the study. Photographs are used in the Methods section to enable readers to imagine the research activities and reduce the amount of text. Technical terms are explained in separate columns. The Study Results section describes only those points of the greatest importance. One simplified graph is used to minimize data.

Making readers sense difficult-to-understand river-related phenomena

Movable mechanisms were installed on the panels for the readers in order to help them sense information that is difficult to recognize just by seeing the rivers and riverside. Such an exhibition method, which establishes a clear educational goal and guides readers toward understanding the essence of phenomena using various human senses, is called the hands-on method. The hands-on method was developed in science museums in the West, and is spreading throughout Japan. The hands-on method was introduced to display river studies in an easy-to-understand manner. The information panels are set along the rivers and enable readers to sense various changes of riverbed environment that are difficult to observe from the streamside and need to be observed for a long period of time to encounter unless the observer is very lucky.

On one of the panels, when the front page is opened fish are shown as if the reader looks into the river. Another panel shows benthos hiding between stones and algae when a reader slides open the front page. Moving such mechanisms enable readers to learn how to watch river spaces, which vary in scale and environment. By rotating the front page, another panel looks at how a river changes before and after flooding, while another shows the self-purification effect of such floods. On another panel, readers pull a lever to produce a flood and see its effect on riverbed algae, thus enabling readers to sense the changes in river flow.

Constituents of target river ecosystems



Respondents: 254 4th to 6th grade students from Kawashima Elementary School, Gifu Prefecture

Layout of text and graphics



Moving mechanism to see graphics that express difficult-to-understand phenomena, the answer to the question, and knowledge acquired by the study (points to communicate)

- 1 Question to arouse interest
- 2 Divided into three sections: Study Points, Methods, and Results. Sentences were itemized.
- 3 Illustration of technical contents
- 4 Background and objectives of the study
- 5 Many photographs enabling research activities to be imagined
Technical terms described in a separate column
- 6 Simplified graph to show only the important results
Future topics mentioned at the end of the graph
- 7 Names of the researchers in charge, e-mail addresses, and website URL to allow readers to ask questions

Hands-on mechanisms to express river phenomena

Inhabiting states of benthos



Shows the percentage of benthos in each microscopic space in the riverbed



Self-purification before and after a flood



Exfoliation and removal of algae before and after a flood



Removal of alien plants and growth of stream beach plants



Column

Much information that is indispensable for understanding river phenomena is hidden underwater where it is difficult to be observed from above the water. Since it is difficult to observe underwater and phenomena that occur infrequently, effective supplementary media are needed. The author has introduced panels and videos and is investigating effective methods for recording videos and arranging them in exhibition spaces for explaining the natural environments of rivers.

