

Paper Number: 4141

How did the earthquake-related content of Rika textbooks change after the 2011 Tohoku-oki earthquake?

Nemoto, H.¹, Takigami, Y.², Miyajima, S.³, and Hatakeyama, M.⁴

¹ Division of Natural Sciences, J. F. Oberlin University, Tokyo, JAPAN, email:nemoJFOberlin@ybb.ne.jp

² Faculty of Economics, Kanto Gakuen University, Gunma, JAPAN

³ Saitama Prefectural Fukuyadai'ichi Upper Secondary School, Saitama, JAPAN

⁴ Seikou Gakuin Secondary School, Yokohama, JAPAN

The 2011 off the Pacific coast of Tohoku Earthquake (Mw9.0) (3.11Eq), which occurred on 11 March 2011, caused enormous damage owing to the resulting huge tsunami, and so on. This study discusses the impact of the 3.11Eq on the contents of textbooks on “Rika”, a subject similar to Natural Science. The occurrence of the 3.11Eq significantly affected the contents of textbooks on certain subjects in schools in Japan, such as Rika and Geography. New versions of Rika textbooks were issued around February 2012 for use in primary and lower and upper secondary schools in Japan. (The Japanese school year begins in April). Therefore, we investigated the concrete differences between the earthquake-related contents of Rika textbooks before and after the 3.11Eq.

We analyzed a total of 36 versions of Rika textbooks, comprising the previous (before the 3.11Eq) and current versions of 18 different textbooks. These textbooks spanned four different levels of education: six books for primary school, five books for lower secondary school, five books for year 10 or 11 of upper secondary school, and two books for year 11 or 12 of upper secondary school. The books used in each level were issued by different publishers. In this abstract, we focus on one type textbook [1] [2] for lower secondary school students.

The total number of pages containing earthquake-related content in the versions of the textbook before and after the 3.11Eq was 11 and 26, respectively, and the number of technical terms related to earthquakes, excluding proper nouns like “the 1995 Kobe Earthquake”, in these two versions was 30 and 72, respectively (Table 1). Furthermore, the organization and scope of the included topics were different

Table 1: Seismological terms appearing in previous and current versions of Rika textbooks for lower secondary school students. Black words appear in both versions, red word appear only in the current version, red underlined words appear only in the previous version, and bold words indicate

Technical term (excluding proper nouns)	Version		Technical term (excluding proper nouns)	Version	
	Previous	Current		Previous	Current
earthquake	○	○	seismic intensity scale	○	○
seismic intensity	○	○	ground	x	○
magnitude	○	○	seismic wave	x	○
tsunami	○	○	distribution of seismic intensity	x	○
tsunami in English	x	○	lifeline	x	○
hypocenter	○	○	JMA magnitude	x	○
epicenter	○	○	moment magnitude	x	○
earthquake source fault	x	○	plate	○	○
source region	x	○	distribution of epicenter	○	○
landslide	○	○	oceanic plate	○	○
ground fissure	○	○	continental plate	○	○
liquefaction	x	○	active fault	x	○
fault	○	○	strain	○	○
earthquake disaster	x	○	ridge	○	○
uplift	○	○	submarine volcano	x	○
subsidence	○	○	trench	○	○
benchmark	x	○	trough	x	○
survey	x	○	hot spot	x	○
GPS	○	○	fold	x	○
Global Positioning System in English	x	○	weathering	x	○
submarine terrace	x	○	erosion	x	○
ria coast	x	○	plain	x	○
river terrace	x	○	limestone	○	○
earthquake information	x	○	chert	x	○
preliminary tremor	○	○	accretion	x	○
principal motion	○	○	metamorphic rock	x	○
P wave	○	○	plate tectonics	x	○
Primary wave in English	○	○	theory of continental drift	x	○
S wave	○	○	theory of sea-floor spreading	x	○
Secondary wave in English	○	○	plume	x	○
duration of preliminary tremor	○	○	plume tectonics	x	○
seismometer	○	○	tsunami information	x	○
longitudinal wave	x	○	earthquake early warning	x	○
transverse wave	x	○	seismic base isolation	x	○
disaster prevention day	x	○	earthquake resistant	x	○
seismic intensity meter	○	○	earthquake simulation vehicle	○	x
Japan Meteorological Agency	x	○	destructive earthquake	○	x

(JSPS).

References:

- [1] Toda M et al. (2005) RIKAI dai'ni bunya Vol.1: Dainippon tosho Publishers:63-73
 [2] Arima A et al. (2012) Science World: Dainippon tosho Publishers:199-262

in the previous and current versions. The order of the topics in the previous version was: (1) principles of earthquakes, (2) seismic effects, and (3) explanation of tectonic plates. The order of the topics in the current version was: (1) seismic effects, (2) principles of earthquakes, (3) earthquake disaster prevention, and (4) plate and plume tectonics. Altogether, the earthquake-related content of the current version of the textbook was well developed in response to the 3.11Eq. However, the topic of earthquake disaster prevention remains insufficiently addressed.

This presentation will include detailed results of the analyses of other textbooks.

Part of this work was supported by Grant-in-Aid Research (KAKENHI) (No. 15K12394) from the Japan Society for the Promotion of Science

