

A Study on Critical Thinking on Biased Web Information among Sixth-Grade Elementary School Students in Japan

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The purpose of this study was to examine the characteristics of the media literacy of children who can engage in critical thinking about biased Web information. First, we examined the relationship between questions related to biased Web information, and attitudes toward media literacy by conducting a survey. Next, we compared children able to engage in critical thinking with those who were unable to engage in critical thinking. Our results confirmed that, with respect to 22 items related to media literacy, children who were able to use critical thinking scored significantly higher than those who were not. The results for these 22 items for which significant differences were found suggest that it is necessary to cultivate media literacy not only through topical instruction, such as “media knowledge” and “awareness of one’s own interactions with the media,” but also through instructions tailored to situations where information is used, such as “skills for reading and understanding media critically.”

Keywords: Media Literacy, Bias, Critical Thinking, Elementary School

Introduction

In Japan, fake news becomes a social problem when disasters occur. Fake news is “information that is not true and is disseminated mainly through websites and social networking services. It sometimes refers to uncertain information transmitted by the mass media” (Shogakukan 2022). However, the term “fake news” is used to refer to various types of information, including intentionally created disinformation, misinformation not created to deceive, propaganda, conspiracy theories, rumors and miscommunications, and misinformation by the media (Fujishiro 2021). During the Kumamoto earthquake in 2016, fake news that a lion escaped from a zoo was spread on Twitter through at least 20,000 retweets per hour (Kumamoto Nichinichi Shimbun 2022). Fake news during the coronavirus disease 2019 pandemic in 2020 became a social problem when incorrect news about a shortage of toilet paper spread through TV news and Twitter. Apart from the fake news problem, more than 80% of people believe that there is too much information today (NHK Broadcasting Culture Research Institute 2018), and the ability to critically read information of various qualities is necessary.

However, cognitive biases are involved in the critical reading of information. According to Kusumi et al. (2015), understanding cognitive biases, which are “distortions of judgment that occur during decision-making,” is necessary to exercise critical thinking when selecting and sifting information. According to Yamamoto (2018), there are also cognitive biases in web search and browsing for information; one example is “position bias,” in which information listed at the top of the search engine results page attracts undue attention.

From the standpoint of media literacy education, Buckingham. D (2019) states that “it is important not only to find what is fake but also to find forms of bias that exist in all information sources more broadly.” In school education, for example, Sato and Sakakibara (2022) developed and evaluated learning materials for fostering media literacy using evaluations of Web information for junior high school students, in which they discussed cognitive biases that can arise when judging the credibility of Web information (Yamamoto et al. 2018). In light of the fact that students are becoming younger and younger in terms of media contact and that each elementary school student is learning by using an information terminal, it is meaningful to consider teaching from the elementary school stage. First, by examining the media literacy characteristics of children who are able to engage in critical thinking about biased Web information, we can gain insight into what kind of media literacy instruction will lead to the development of critical thinking.

Therefore, this study aimed to examine the characteristics of the media literacy of children who can engage in critical thinking on biased Web information.

Research Design & Methods

Survey Target and Survey Period

In mid-October 2021, 334 sixth graders from 17 public elementary schools were requested to take part in the survey.

Research Methods

The survey question was composed of two parts. In the first part, respondents were asked to respond with “agree,” “agree a little,” “neither agree nor disagree,” “disagree a little,” and “disagree” to 33 items with regard to media literacy (Sato and Nakahashi 2014), which are necessary to be a recipient of information. The second part, referring to the item on tolerance for cognitive biases that may arise when judging the credibility of web information (Yamamoto et al. 2018), sought responses to four questions on the decision to consume when viewing web information containing biases and the process of deciding on the consumption behavior (Figure 1 and Table 1). The questions were created with reference to the items “Web information with a high number of likes, citations, and shares on SNS is trustworthy,” “Web information that friends and acquaintances cite and share on social networking sites is trustworthy,” “Information on web pages with titles such as ‘Popularity 00 Ranking’ or ‘Recommended 00’ can be trusted,” “Web information ranked high by web search engines is trustworthy,” and “The quality of products and services with high average word-of-mouth ratings on review sites can be trusted” (Yamamoto et al. 2018). The respondents were asked to answer questions regarding their consumption decisions using a five-point scale: “agree,” “agree a little,” “neither agree nor disagree,” “disagree a little,” and “disagree.” The questions regarding the decision-making process on consumption behavior required an open-ended response clarifying the reason for choosing the option.

Figure 1

Images used for questions



Table 1

Questions about biased Web information

(1) : The following images are information shared on the Internet. (Figure 1, Left)	
(1) - 1 : This information was ranked No. 1 in the web search rankings. Do you want to buy toilet paper after reading this information? Please select one of the following five options.	five-point scale
: Please describe in as much detail as possible why you chose that option.	open-ended response
(1) - 2 : Many people "liked" and "shared" this information. Do you want to buy toilet paper after reading this information? Please select one of the following five options.	five-point scale
: Please describe in as much detail as possible why you chose that option.	open-ended response
(2) : The following images are information shared on the Internet. (Figure 1, Right)	
(2) - 1 : You found this information on the Internet when you were looking for a shampoo. Would you buy this shampoo? Please select one of the following five options.	five-point scale
: Please describe in as much detail as possible why you chose that option.	open-ended response
(2) - 2 : This information was shared by a friend. Would you buy shampoo if your friend shared this information with you? Please select one of the following five options.	five-point scale
: Please describe in as much detail as possible why you chose that option.	open-ended response

Analysis Methods

Tezuka et al. (2021a) show that there is no correlation between the decision to consume while viewing biased Web information and whether or not critical thinking is used in the process leading up to the decision to consume. Therefore, we decided to focus on whether the students used critical thinking in the process of deciding their consumption behavior. Therefore, following Tezuka et al. (2021b), students were divided into two groups: those who were able to use critical thinking in all problems and those who were not able to use critical thinking. An unpaired t-test was conducted on 33 items related to the level of media literacy required to receive information. The items for which significant differences were found were then divided into properties in terms of teaching methods and discussed by the first and second authors.

Results

The children were divided into two groups: those who were able to think critically about biased Web information and those who were unable to do so, and an unpaired t-test was conducted on 33 items related to the level of media literacy required to receive information. The results showed that the children who were able to think critically about biased Web information scored significantly higher on 22 of the 33 items.

Discussion

Ten of the 22 items that showed significant differences were related to media knowledge; for example, "I think it is OK to make any kind of homepage if it is interesting," "Internet news tells all the facts as they are," and "I think TV and newspapers are fair and neutral." Seven of the remaining 12 items were related to the students' awareness of the media; for example, "Even when there are conflicting opinions, I tend to believe one side of the story without thinking (reversal item)," "I can try to understand opinions different from my own," and "I try to think about things from various perspectives." In Japanese school education, teachers who recognize the importance of media literacy education have been experimenting with the subject since the 1990s, but many schools do not yet provide a course due to disincentives, such as the lack of recognition of media literacy education and that it is not specified in the Courses of Study as compulsory (Nakahashi 2009). Practices by teachers who recognize the importance of media literacy education include the development of units, learning programs, and curricula, and the use of educational materials such as school broadcast programs to teach media literacy in a topical manner (Tezuka et al. 2022). "Knowledge about the media" and "awareness of one's own involvement with the media" are items that can be considered by the students through topical instruction.

The remaining five items are "watching the news while separating facts from opinions," "reading newspapers while separating facts from opinions," "watching the news and reading newspapers while paying attention to when, where, who, what, why, and how," and "using other media to confirm what they researched in their research studies." These are items related to the skills needed to read and understand media critically. In Japan, the GIGA School Initiative, which will equip all public elementary and junior high schools with high-speed, high-capacity communication networks and an information terminal for each student, began in 2019 (Ministry of Education, Culture, Sports, Science and Technology 2019). At present, more than 90% of elementary and junior high schools have completed the installation (Ministry of Education, Culture, Sports, Science and Technology 2022). It is important to teach "skills for reading media critically" and encourage students to demonstrate these skills in situations where information terminals are used.

These findings suggest that to cultivate critical thinking on biased Web information, it is necessary to cultivate media literacy through topical instructions, such as “knowledge about the media” and “awareness of one's own interactions with the media,” as well as tailored to situations where information is used, such as “skills for reading media critically.”

Conclusion

The purpose of this study was to examine the characteristics of media literacy of children who can engage in critical thinking about biased Web information. First, we examined the relationship between questions related to biased Web information, and attitudes toward media literacy by conducting a survey. Next, a comparison was made between children able to engage in critical thinking and those who were not. The study confirmed that children who were able to use critical thinking scored significantly higher than those who were not with respect to 22 items related to media literacy. The significant differences found in these items suggest that students need to acquire media literacy through topical instructions, such as “media knowledge” and “awareness of one's own interactions with the media,” and instructions tailored to specific use situations, such as “skills for reading and understanding media critically.”

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