

# ELSI (Ethical, Legal, and Social Issues) Education on Digital Technologies: In the Field of Elementary and Secondary Education

Nagayoshi Nakazono<sup>[0000-0001-9861-8906]</sup>

Faculty of Global Studies, Reitaku University  
Kashiwa, Chiba, Japan  
nnakazon@reitaku-u.ac.jp

**Abstract.** This research proposes the need to introduce ELSI education (education of ethical, legal, and social issues) on digital technologies in school education, such as primary and secondary education. Nowadays, various advanced technologies such as artificial intelligence and data science are used in our daily lives. New ethical, legal, and social issues arise in the use of new technologies, and the concept of ELSI, which examines these issues, is gaining popularity. ELSI is the examination of the ethical, legal, and social issues and implications of science, technology, and research. In order to properly utilize advanced technologies, it is necessary to involve the general public in ELSI, and education on ELSI is necessary to obtain the basic knowledge and understanding for this purpose. This paper defines ELSI education as “Learning with ELSI” education and proposes the necessity of introducing ELSI education in primary and secondary education. In order to implement ELSI education, teachers need to have sufficient knowledge of ethics, law, and society, and they also need to be up-to-date with the changes in the information society. ELSI education should not be introduced as an entirely new education, but as a new concept on top of existing education. As a concrete practical example, a learning using machine-learning chatbot statements is considered. In this example, it is shown that by viewing the relationship between chatbots and society from the perspective of ethics and law, it is possible to realize learning that considers how to be mindful when utilizing technologies. In an age in which advanced technologies are emerging one after another, it is important to promote ELSI education according to the developmental stage of learners from the early stage of primary and secondary education. ELSI should be regarded as a “handle” for realizing better education, and its practice should be promoted.

**Keywords:** ELSI Education, Ethics, Elementary and Secondary Education, Artificial Intelligence, Advanced Technologies