

Abduction as an Inquiry Method in Earth Science

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The goal of this study is to provide a foundation for developing and implementing earth science inquiry activities based on abduction as a scientific inquiry method. Through the review of relevant literature, the study examined the nature of earth science in terms of the goals of earth science inquiry and the characteristics of what is investigated in earth science. It also explored the meanings and forms of abduction, thinking strategies used in the abductive inference, and the abductive inquiry model. Abduction is the process of inferring certain facts, principles, laws, and hypotheses in order to explain some phenomena, and this method is likely to be suited well to the earth science inquiry which studies the causes and processes of the earth environment. Abduction has the nature of ampliative, selective, evaluative, and creative inference, and several thinking strategies, including reconstruction of data, heuristic generalization, analogy, existential, conceptual combination, and elimination strategies, are employed in the abductive inference. The abductive inquiry model is believed to be adaptable to earth science classrooms, and it is therefore suggested that earth science instructions should be based on the abductive method and that research work concerning the abductive inquiry in the classroom should follow.

Keywords: abduction, abductive inquiry, earth science education, the nature of earth science