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STEAM Approach to Improve Environmental Education Innovation and Literacy in Waste Management: Bibliometric Research

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Abstract

The need for environmental literacy in development agenda has been pressing since the UN proposed the agenda of achieving Sustainable Development Goals (SDGs). One of the vital aspect of in sustainable development is about waste management to reduce earth's pollution. Environmental Literacy were considered as one of the few perspectives necessary for SDGs to be achieved. Education for Sustainable Development (ESD), formerly known as Environmental Education, through science education is one way to develop the environmental literacy of the society through classroom activities. One approach that fits closely to this need is STEAM approach. STEAM is a combination of five different disciplines namely Science, Technology, Engineering, Art and Mathematics. This approach has a room for developing students' environmental literacy within its Arts aspect. Teaching Environmental literacy through STEAM would help students not only learning how to be a scientist or engineer, but also building their scientific awareness to environmental issue, which will be the underlying value of their STEM insight. This study seeks to find the current state of the arts of this concept through a bibliometric research. This research was conducted using the Publish or Perish application to create a database of journal articles, which further managed using Zotero application. After managing the database, this study classified and visualized the database using VOSviewer software. The terms "Environmental Literacy", "STEAM", and "waste management" were used to search the relevant published journal article related to all three concepts, as indexed in Google Scholar since 1969 to 2020. This study found only a total of 163 result from Google Scholar Index. Further refinement of the results shows that published research are still scarce in the last 51 years and in need of further study to strengthen the concept. Authors also discuss about several suggestions on how STEAM could be considered as a way to develop students Environmental Literacy on waste management.

Keywords: environmental literacy, environmental education innovation, STEAM, literacy in waste management

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