

**PENGEMBANGAN MEDIA EDUKASI BERBASIS GAME TENTANG
PENCEGAHAN PENCEMARAN EKOSISTEM LAUT DALAM TUJUAN
PEMBANGUNAN BERKELANJUTAN (SDGs) KE-14**

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ABSTRAK

Pencemaran ekosistem laut merupakan permasalahan lingkungan yang dapat mengancam keberlangsungan biota dan kualitas ekosistem laut serta berkaitan dengan Tujuan Pembangunan Berkelanjutan (*Sustainable Development Goals/SDGs*) ke-14, yaitu *Life Below Water*. Penyampaian informasi mengenai pencemaran dan pelestarian ekosistem laut kepada anak usia 10–15 tahun memerlukan media yang menarik dan interaktif. Penelitian ini bertujuan untuk mengembangkan game sebagai media edukasi *Ocean Guardian: Save Our Sea* sebagai media edukasi mengenai pencegahan pencemaran ekosistem laut serta mengetahui validitas produk dan respons pengguna terhadap game yang dikembangkan. Penelitian menggunakan metode *Research and Development (R&D)* dengan model *Multimedia Development Life Cycle (MDLC)* yang terdiri atas enam tahap, yaitu *concept, design, material collecting, assembly, testing, dan distribution*. Game dikembangkan menggunakan Construct 3 dengan mengintegrasikan materi edukasi, teks, gambar, animasi, audio, video, aktivitas permainan, kuis, dan *feedback*. Tahap pengujian dilakukan melalui *white-box testing, black-box testing*, uji ahli isi, uji ahli media, dan uji respons pengguna. Uji ahli isi dan ahli media masing-masing melibatkan dua validator dengan analisis Gregory, sedangkan uji respons pengguna melibatkan 49 anak usia 10–15 tahun di Kabupaten Buleleng menggunakan instrumen skala Likert. Hasil *white-box testing* menunjukkan seluruh logika internal yang diuji berjalan sesuai rancangan, sedangkan *black-box testing* menunjukkan seluruh 19 fungsi utama game memperoleh status berhasil. Uji ahli isi dan ahli media masing-masing memperoleh koefisien validitas Gregory sebesar 1,00 dengan kategori validitas sangat tinggi. Uji respons pengguna memperoleh total skor 1.523 dengan rata-rata 31,08 yang termasuk kategori Sangat Baik. Sebanyak 47 responden (95,92%) berada pada kategori Sangat Baik dan 2 responden (4,08%) pada kategori Baik. Dengan demikian, *Ocean Guardian: Save Our Sea* telah berhasil dikembangkan sebagai game sebagai media edukasi berbasis web yang memiliki fungsi sesuai rancangan, validitas ahli yang sangat tinggi, serta memperoleh respons pengguna yang sangat

baik dalam mendukung edukasi mengenai pencegahan pencemaran ekosistem laut yang berkaitan dengan SDGs ke-14.

Kata Kunci: Game Simulasi Interaktif, Pencemaran Ekosistem Laut, SDGs 14, MDLC, Construct 3.



**DEVELOPMENT OF GAME-BASED EDUCATIONAL MEDIA FOR
MARINE ECOSYSTEM POLLUTION PREVENTION IN SUPPORT OF
SUSTAINABLE DEVELOPMENT GOAL (SDG) 14**

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ABSTRACT

Marine ecosystem pollution is an environmental problem that can threaten marine organisms and the quality of marine ecosystems and is closely related to Sustainable Development Goal (SDG) 14, Life Below Water. Providing information about marine pollution and ecosystem conservation to children aged 10–15 requires an engaging and interactive medium. This study aimed to develop an interactive simulation game entitled Ocean Guardian: Save Our Sea as an educational medium for marine ecosystem pollution prevention and to determine the product validity and user responses to the developed game. This study employed a Research and Development (R&D) approach using the Multimedia Development Life Cycle (MDLC) model, consisting of six stages: concept, design, material collecting, assembly, testing, and distribution. The game was developed using Construct 3 by integrating educational content, text, images, animations, audio, video, game activities, quizzes, and feedback. The testing stage included white-box testing, black-box testing, content expert validation, media expert validation, and user response testing. Content and media validation each involved two experts and were analyzed using the Gregory method, while the user response test involved 49 children aged 10–15 years in Buleleng Regency using a Likert-scale questionnaire. The white-box testing results showed that all tested internal logic operated according to the design, while black-box testing confirmed that all 19 main functions of the game were successfully executed. Content and media expert validation each obtained a Gregory validity coefficient of 1.00, indicating a very high level of validity. The user response test obtained a total score of 1,523 with an average score of 31.08, categorized as Very Good. A total of 47 respondents (95.92%) were categorized as Very Good and 2 respondents (4.08%) as Good. Therefore, Ocean Guardian: Save Our Sea was successfully developed as a web-based interactive simulation game with functions that operated according to the design, very high expert validity, and very positive user responses in supporting education on marine ecosystem pollution prevention related to SDGs 14.

Keywords: Interactive Simulation Game, Marine Ecosystem Pollution, SDG 14, MDLC, Construct 3.

