ABSTRACT

Putri Wanna Oktavia Sinaga, NIM 4223141040 (2022). ***Development of a STEAM-Based Digital Pocket Book to Improve Students' Scientific Literacy on the Topic of Biological Innovation and Technology in Grade X at SMA Negeri 14 Medan.***

The low level of scientific literacy in Indonesia, as indicated by the results of the Programme for International Student Assessment (PISA), shows that students' ability to understand and apply scientific concepts remains below the international average. This condition is also found among Grade X students at SMA Negeri 14 Medan, whose scientific literacy skills are categorized as low. This situation highlights the need for innovative learning materials that can support the improvement of scientific literacy through instruction on the topic of Biological Innovation and Technology. This study aims to develop a STEAM-based (Science, Technology, Engineering, Arts, and Mathematics) Digital Pocket Book that is valid, practical, and effective in improving students' scientific literacy skills on the topic of Biological Innovation and Technology. This research employs a Research and Development (R&D) approach with stages including analysis, design, development, and evaluation. The research instruments consist of expert validation sheets, teacher and student response questionnaires, as well as pretest and posttest instruments analyzed using the N-Gain test. The results show that the STEAM-based Digital Pocket Book achieved a feasibility percentage of 80%, categorized as valid. The level of practicality based on teacher responses reached 89% (very practical category), while student responses reached 95% (practical category). The effectiveness test indicates an improvement in students' scientific literacy skills in the moderate category based on the N-Gain score. Therefore, the STEAM-based Digital Pocket Book is considered valid, practical, and effective as a learning resource to enhance students' scientific literacy.

Keywords: *Digital Pocket Book, STEAM, scientific literacy, development, Biological Innovation and Technology.*

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ABSTRAK

Putri Wanna Oktavia Sinaga, NIM 4223141040 (2022). Pengembangan Buku Saku Digital Berbasis STEAM untuk Meningkatkan Kemampuan Literasi Sains Siswa pada Materi Inovasi dan Teknologi Biologi di Kelas X SMA Negeri 14 Medan

Rendahnya literasi sains di Indonesia berdasarkan hasil *Programme for International Student Assessment* (PISA) menunjukkan bahwa kemampuan peserta didik dalam memahami dan menggunakan konsep sains masih berada di bawah rata-rata internasional. Kondisi tersebut juga ditemukan pada siswa kelas X SMA Negeri 14 Medan yang menunjukkan kemampuan literasi sains pada kategori rendah. Kondisi ini menunjukkan perlunya inovasi bahan ajar yang mampu mendukung peningkatan literasi sains melalui pembelajaran pada materi Inovasi dan Teknologi Biologi. Penelitian ini bertujuan untuk mengembangkan Buku Saku Digital berbasis STEAM (*Science, Technology, Engineering, Arts, and Mathematics*) yang layak, praktis, dan efektif dalam meningkatkan kemampuan literasi sains peserta didik pada materi Inovasi dan Teknologi Biologi. Penelitian ini merupakan penelitian dan pengembangan (Research and Development) dengan tahapan analisis, desain, pengembangan, dan evaluasi. Instrumen penelitian meliputi lembar validasi ahli, angket respon guru dan peserta didik, serta tes pretest dan posttest yang dianalisis menggunakan uji N-Gain. Hasil penelitian menunjukkan bahwa Buku Saku Digital berbasis STEAM memperoleh persentase kelayakan sebesar 80% dengan kategori layak. Tingkat kepraktisan berdasarkan respon guru sebesar 89% dengan kategori sangat praktis dan respon peserta didik sebesar 95% dengan kategori praktis. Uji efektivitas menunjukkan adanya peningkatan kemampuan literasi sains dengan kategori sedang berdasarkan nilai N-Gain. Buku Saku Digital berbasis STEAM dinyatakan layak, praktis, dan efektif digunakan sebagai sumber belajar untuk meningkatkan literasi sains peserta didik.

Kata kunci : Buku Saku Digital, STEAM, literasi sains, pengembangan, Inovasi Teknologi Biologi.