

**PENGEMBANGAN SPEKTROFOTOMETER SINAR TAMPAK PONSEL  
BERBASIS 3D *PRINTER* PADA MATERI KIMIA UNSUR DI SMA**

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**ABSTRAK**

Perkembangan pendidikan pada masa kini perlu mengikuti perkembangan ilmu pengetahuan dan teknologi. Materi praktikum kimia unsur yang terbatas menyebabkan peserta didik tidak mendapatkan kesempatan belajar yang sesuai dengan perkembangan ilmu. Salah satu topik praktikum kimia unsur yang sesuai dengan perkembangan teknologi adalah penggunaan spektrofotometer untuk mempelajari sifat unsur transisi. Penelitian ini mengembangkan produk berupa spektrofotometer sinar tampak ponsel yang dapat digunakan dalam pembelajaran. Penelitian ini menggunakan model pengembangan ADDIE. Produk layak untuk digunakan pada praktikum materi kimia unsur di SMA berdasarkan hasil validasi ahli dan praktisi dengan skor validasi ahli 80% dan 93%, serta skor validasi praktisi 95%, 78%, dan 85%. Hasil uji coba terbatas menunjukkan adanya peningkatan hasil belajar peserta didik setelah menggunakan produk. Peningkatan hasil belajar ditinjau melalui perolehan skor *N-Gain*, dengan 40% peserta didik memperoleh klasifikasi tinggi, 33% sedang, dan 27% rendah. Aktivitas peserta didik diamati oleh observer dengan hasil 90% peserta didik mampu menggunakan produk dengan baik, dan hanya 50% peserta didik yang mampu menghitung konsentrasi larutan dengan baik. Respon peserta didik terhadap produk sangat baik dengan skor angket rata-rata 86%. Hasil penelitian diperoleh perangkat spektrofotometer sinar tampak ponsel yang valid dan berdampak sangat baik dalam peningkatan hasil belajar peserta didik pada materi kimia unsur transisi.

**Kata kunci:** 3D *Printer*, Kimia Unsur, Penelitian Pengembangan, Spektrofotometer

**DEVELOPMENT OF 3D PRINTER-BASED VISIBLE LIGHT  
SPECTROPHOTOMETER SMARTPHONE ON CHEMICAL  
ELEMENTS IN HIGH SCHOOLS**

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**ABSTRACT**

*Education today needs to develop along with the development of science and technology. But in reality, students do not get learning opportunities that are relevant to the development of science and technology because of the limited chemical elements practicum material. One of the practical topics of elemental chemistry that is in accordance with technological developments is the use of a spectrophotometer to study the properties of transition elements. This research develops a product in the form of a visible light spectrophotometer smartphone that can be used in learning. This study uses the ADDIE development model. The product is suitable for use in chemical elements practicum in high school based on the results of expert and practitioner validation with expert validation scores of 80% and 93%, practitioner validation scores of 95%, 78%, and 85%. The results of the limited trial showed an increase in student learning outcomes after using product. The improvement in learning outcomes was assessed through the acquisition of N-Gain scores, with 40% of students obtaining high classification, 33% medium and 27% low. The student's activity was observed by the observer with the result that 90% of the students were able to use the product well, but only 50% of the students were able to calculate the concentration of the solution properly. The response of students to the product was very good with an average questionnaire score of 86%. The results of the study obtained that the visible light spectrophotometer smartphone device was valid and had a very good impact on improving student learning outcomes in transitional elemental chemistry lessons.*

**Keywords:** *3D Printer, Chemical Elements, Research and Development, Spectrophotometer*