

## ABSTRAK

**PENGEMBANGAN MODUL AJAR IKATAN KIMIA BERBASIS  
AUGMENTED REALITY MENGGUNAKAN APLIKASI ASSEMBLR EDU**

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Modul ajar adalah bahan ajar yang dirancang secara sistematis sesuai dengan kurikulum tertentu. Peserta didik di SMA Santa Maria Yogyakarta sulit memahami materi hidrokarbon dan termokimia di kelas XI khususnya penentuan perubahan entalpi berdasarkan energi ikatan pada materi termokimia karena konsep ikatan kimia di kelas X belum dipahami dengan baik sehingga dibutuhkan suatu produk untuk mengatasi masalah tersebut. Modul ajar ikatan kimia berbasis *augmented reality* dapat menjadi salah satu solusi yang dapat membantu peserta didik dalam mempelajari materi ikatan kimia. Penelitian ini bertujuan untuk: (1) mengembangkan modul ajar ikatan kimia berbasis *augmented reality* menggunakan aplikasi Assemblr EDU dengan model pengembangan ADDIE (*Analysis, Design, Development, Implementation, dan Evaluation*); (2) mengetahui kriteria validitas, efektivitas, dan kepraktisan produk modul ajar ikatan kimia berbasis *augmented reality* menggunakan aplikasi Assemblr EDU. Jenis penelitian yang digunakan yaitu R & D (*Research and Development*) dengan model pengembangan ADDIE. Hasil yang diperoleh dari penelitian ini yaitu : (1) modul ajar ikatan kimia berbasis *augmented reality* menggunakan aplikasi Assemblr EDU dikembangkan dengan model pengembangan ADDIE karena tahapan pengembangan lengkap; (2) produk modul ajar ikatan kimia berbasis *augmented reality* menggunakan aplikasi Assemblr EDU sangat valid pada segi materi dengan nilai sebesar 89,33% dan 93,5% pada segi media, sangat praktis dengan rata-rata persentase sebesar 88,14% dengan kriteria respon yang sangat baik, serta efektif dengan nilai rata-rata hasil evaluasi peserta didik sebesar 70 yang termasuk kriteria tinggi.

**Kata kunci:** Modul ajar, *augmented reality*, ikatan kimia

**ABSTRACT****DEVELOPMENT OF AUGMENTED REALITY-BASED CHEMICAL BOND TEACHING MODULE ASSISTED BY THE ASSEMBLR EDU APPLICATION**

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*Teaching modules are teaching materials that are systematically designed according to a particular curriculum. Students at Santa Maria Yogyakarta High School find it difficult to understand hydrocarbon and thermochemistry material in class XI, especially determining enthalpy changes based on bond energies in thermochemical material because the concept of chemical bonds in class X is not well understood so a product is needed to overcome this problem. Augmented reality-based chemical bond teaching modules can be a solution that can help students learn chemical bonding material. This study aims to: (1) develop a chemical bond teaching module based on augmented reality using the Assemblr EDU application with the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation); (2) knowing the criteria for the validity, effectiveness, and practicality of augmented reality-based chemical bond teaching module products using the Assemblr EDU application. The type of research used is R & D (Research and Development) with the ADDIE development model. The results obtained from this study are: (1) the chemical bond teaching module based on augmented reality using the Assemblr EDU application was developed using the ADDIE development model because the stages of development are complete; (2) the chemical bond teaching module product based on augmented reality using the Assemblr EDU application is very valid in terms of material with a value of 89.33% and 93.5% in terms of media, very practical with an average percentage of 88.14% with the criteria very good response, and effective with an average value of student evaluation results of 70 which is included in the high criteria.*

**Keywords:** *Teaching module, augmented reality, chemical bond*