Abstract

Nur Afni. 2021. Development of PowerPoint-iSpring Learning Media on Stoichiometry with Emphasis on Three Levels of Chemical Representation to Improve Students' Higher Order Thinking Skills. Thesis. Chemistry Education Masters Study Program. Faculty of Math and Science. State University of Padang.

Stoichiometry is a difficult topic for students because it is complex and to understand it students must know the molecular formula, design chemical reactions, and calculations. In order to make it easier, this topic needs to be explained with three levels of chemical representation. However, the three levels of chemical representation are still difficult for students to understand. The difficulty of students in understanding the three levels of chemical representation is due to the fact that in the learning process students tend to use representations at the macroscopic and symbolic levels only. The aims of this research is to reveal the validity, practicality and effectiveness of PowerPoint-iSpring learning media on Stoichiometry with emphasis on three levels of chemical representation to improve students' higher order thinking skills and learning outcome. This type of research is Research & Development (R&D). The learning media was developed with Plomp. The research instruments used are validity, practicality questionnaire, and test questions. The learning media was validated by 5 validators. The subjects of the practicality and effectiveness test were 155 students of class X who were divided into experimental class and control class and 3 chemistry teachers from high school in Padang City. Validity test was analyzed using Aiken's V formula and practicality was analyzed using percent practicality. The validity scores result is 0.854 with a very valid category. Practicality results by teachers and students are 88.23 and 85.77 with very practical categories. The results of the effectiveness showed that PowerPoint-iSpring learning media had an effect on students' higher order thinking skills, as evidenced by the increase in the pretest to posttest scores. The results of the normality and homogeneity test stated that the higher order thinking skills of all sample classes were normally distributed and homogeneous. The results of the hypothesis test of students' higher-order thinking skills obtained a value of Sig. (2-tailed) <0.05, meaning that the higher-order thinking skills of students who learned to use PowerPoint-iSpring learning media were differ significantly.

Keywords: learning media, powerpoint-ispring, three levels of chemical representation, higher order thinking skills, stoichiometry

Abstrak

Nur Afni. 2021. Pengembangan Media Pembelajaran *PowerPoint-iSpring* pada Materi Stoikiometri dengan Penekanan pada Tiga Level Representasi Kimia untuk Meningkatkan Keterampilan Berpikir Tingkat Tinggi Siswa. Tesis. Program Studi Magister Pendidikan Kimia. Fakultas Matematika dan Ilmu Pengetahuan Alam. Universitas Negeri Padang.

Stoikiometri merupakan materi yang sulit bagi siswa karena bersifat kompleks dan untuk memahaminya siswa harus mengetahui rumus molekul, merancang reaksi kimia, serta melakukan perhitungan. Supaya menjadi tidak sulit lagi, maka materi ini perlu dijelaskan dengan tiga level representasi kimia. Namun tiga level representasi kimia masih sulit dipahami oleh siswa. Kesulitan siswa dalam memahami tiga level representasi kimia disebabkan dalam proses pembelajaran siswa cenderung menggunakan representasi pada level makroskopik dan simbolik saja. Penelitian ini bertujuan mengungkap validitas, praktikalitas dan efektivitas dari media pembelajaran *PowerPoint-iSpring* pada materi Stoikiometri dengan penekanan pada tiga level representasi kimia untuk meningkatkan keterampilan berpikir tingkat tinggi siswa. Jenis penelitian ini adalah *Reseach & Development* (R&D) dengan model pengembangan Plomp. Instrumen penelitian yang digunakan yaitu angket validitas, praktikalitas, dan soal tes. Media pembelajaran divalidasi oleh 5 orang validator. Subjek uji praktikalitas dan efektivitas yaitu 155 siswa kelas X yang terbagi menjadi kelas eksperimen dan kelas kontrol serta 3 orang guru kimia yang berasal dari SMA di Kota Padang. Uji validitas dianalisis menggunakan formula Aiken's V dan praktikalitas dianalisis menggunakan persen praktikalitas. Hasil validitas diperoleh nilai 0,854 dengan kategori sangat valid. Hasil praktikalitas oleh guru dan siswa memperoleh hasil 88,23 dan 85,77 dengan katogori sangat praktis. Hasil efektivitas menunjukkan bahwa media pembelajaran *PowerPoint-iSpring* berpengaruh terhadap keterampilan berpikir tinggi siswa, terbukti dengan peningkatan nilai *pretest* ke *posttest*. Hasil uji normalitas dan homogenitas menyatakan bahwa keterampilan berpikir tingkat tinggi semua kelas sampel berdistribusi normal dan homogen. Hasil uji hipotesis keterampilan berpikir tingkat tinggi siswa memperoleh nilai Sig.(2-tailed) < 0,05 artinya keterampilan berpikir tingkat tinggi siswa yang belajar menggunakan media pembelajaran *PowerPoint-iSpring* berbeda secara signifikan.

Kata kunci: media pembelajaran, *powerpoint-ispring,* tiga level representasi kimia, keterampilan berpikir tingkat tinggi, stoikiometri