

**DESAIN DIDAKTIS BERORIENTASI *SUSTAINABILITY* PADA TOPIK
PENGOLAHAN AIR UNTUK MENGEKEMBANGKAN LITERASI SAINS
MAHASISWA CALON GURU KIMIA**

TESIS

Diajukan untuk memenuhi sebagian dari syarat untuk memperoleh gelar
Magister Pendidikan pada Program Studi Pendidikan Kimia



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PERNYATAAN

Dengan ini saya menyatakan bahwa tesis dengan judul “Desain Didaktis Berorientasi *Sustainability* Pada Topik Pengolahan Air Untuk Mengembangkan Literasi Sains Mahasiswa Calon Guru Kimia” beserta seluruh isinya adalah benar-benar karya saya sendiri, dan saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika keilmuan yang berlaku. Atas pernyataan ini, saya siap menanggung resiko atau sanksi yang dijatuhkan kepada saya apabila dikemudian hari ditemukan adanya pelanggaran terhadap etika keilmuan dalam karya saya ini, atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

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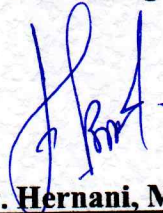
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ABSTRAK

Penelitian ini bertujuan untuk merancang desain didaktis berorientasi sustainability pada topik pengolahan air untuk mengatasi hambatan belajar dan mengembangkan literasi sains mahasiswa calon guru kimia. Desain didaktis dirancang menggunakan *Didactical Design Research* yang mencakup situasi didaktis (sebelum, saat dan setelah pembelajaran), prediksi respons mahasiswa calon guru kimia yang muncul dan antisipasi pendidik. Penelitian ini dilakukan terhadap mahasiswa calon guru kimia di salah satu Perguruan Tinggi Negeri di Bandung. Instrumen yang digunakan berupa soal tes, lembar validasi ahli, dan lembar analisis transkrip rekaman video. Berdasarkan analisis sebelum pembelajaran, sebagian besar literasi sains awal mahasiswa berada dalam kategori rendah dan pemahaman mahasiswa masih lemah pada beberapa konsep diantaranya: (a) pencemaran air; (b) tahapan proses pengolahan air; (c) proses mekanisme terjadinya koagulasi; (d) perbedaan antara koagulan sintesis dan koagulan alami (e) turbiditas air; (f) keunggulan koagulan berdasarkan struktur; (g) konsep keberlanjutan dalam pengolahan air menggunakan koagulan alami. Hasil analisis hambatan belajar digunakan untuk merancang desain didaktis yang kemudian divalidasi oleh ahli. Rancangan pengembangan desain didaktis disusun atas situasi didaktis, prediksi respons, dan antisipasi didaktis dan pedagogis. Setelah desain diterapkan pada pembelajaran, diperoleh informasi bahwa sebagian besar respons yang muncul sesuai dengan yang dirancang oleh pendidik dan hasil akhir literasi sains serta pemahaman mahasiswa calon guru kimia mengalami perkembangan. Berdasarkan hal ini, diketahui bahwa desain didaktis berorientasi *sustainability* pada topik pengolahan air menggunakan koagulan alami berpotensi untuk mengembangkan literasi sains serta mengatasi hambatan belajar mahasiswa calon guru kimia.

Kata kunci: desain didaktis, *sustainability*, hambatan belajar, pengolahan air, koagulan alami, literasi sains, mahasiswa calon guru kimia

ABSTRACT

This study aims to design a sustainability-oriented didactical design on water treatment topic to overcome learning obstacle and develop science literacy of preservice chemistry teacher. The didactical design was designed using Didactical Design Research which includes the didactical situation (before, during and after learning), prediction of the responses of preservice chemistry teacher that appear and anticipation of educators. This research was conducted on preservice chemistry teacher at one of the State Universities in Bandung. The instruments used were test questions, expert validation sheets, and video recording transcript analysis sheets. Based on pre-learning analysis, most of the students' initial science literacy was in the low category and students' understanding was still weak on several concepts including: (a) water pollution; (b) stages of water treatment process; (c) the process of coagulation mechanism; (d) the difference between synthetic coagulants and natural coagulants (e) water turbidity; (f) coagulant advantages based on structure; (g) the concept of sustainability in water treatment using natural coagulants. The results of the analysis of learning obstacle were used to design a didactic design which was then validated by experts. The design of didactic design development is organized on didactic situation, response prediction, and didactic and pedagogical anticipation. After the design was applied to learning, information was obtained that most of the responses that appeared were in accordance with those designed by educators and the final results of science literacy and understanding of preservice chemistry teacher had developed. Based on this, it is known that sustainability-oriented didactical design on the topic of water treatment using natural coagulants has the potential to develop science literacy and overcome learning obstacle of preservice chemistry teacher.

Keywords: didactic design, sustainability, water treatment, natural coagulants, scientific literacy, preconception, pre-service teacher

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