Implementasi Pembelajaran STEAM Berbantuan *Microsite* untuk Meningkatkan Kreativitas dan Kemampuan Pemecahan Masalah Matematis Siswa SMA Ditinjau dari Gender

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Abstrak

Penelitian ini dilatarbelakangi oleh perlunya inovasi pembelajaran matematika yang mampu meningkatkan kreativitas dan kemampuan pemecahan masalah matematis siswa SMA. Penelitian ini bertujuan untuk mengembangkan media pembelajaran STEAM berbantuan microsite serta menganalisis pengaruhnya terhadap kreativitas dan kemampuan pemecahan masalah matematis siswa ditinjau dari gender. Penelitian ini menggunakan metode *Research and Development* dengan pendekatan *mixed-method* dan model pengembangan 4D, yaitu *define, design, develop,* dan *disseminate*. Subjek implementasi terdiri atas 72 siswa kelas XI SMAN 1 Margahayu, yaitu 36 siswa pada kelas eksperimen dan 36 siswa pada kelas kontrol. Kelas eksperimen terdiri atas 14 siswa laki-laki dan 22 siswa perempuan, sedangkan kelas kontrol terdiri atas 17 siswa laki-laki dan 19 siswa perempuan. Kelas eksperimen memperoleh pembelajaran STEAM berbantuan microsite, sedangkan kelas kontrol memperoleh pembelajaran konvensional. Data dikumpulkan melalui angket kebutuhan, wawancara guru, validasi ahli, angket respons siswa, dokumentasi, serta posttest kreativitas dan kemampuan pemecahan masalah matematis. Hasil validasi menunjukkan bahwa media sangat valid, dengan S-CVI ahli media sebesar 1,00 dan S-CVI/Ave ahli materi sebesar 0,95. Penilaian guru menunjukkan persentase kelayakan sebesar 91,39% dengan kategori sangat layak. Uji coba terbatas dilakukan kepada 37 siswa, dan sebanyak 25 siswa mengisi angket respons. Hasil angket respons siswa memperoleh persentase 83,57% dengan kategori baik. Hasil penelitian menunjukkan bahwa kreativitas siswa kelas eksperimen lebih tinggi daripada kelas kontrol, dengan rata-rata 6,78 dibandingkan 5,33. Kemampuan pemecahan masalah matematis siswa kelas eksperimen juga lebih tinggi daripada kelas kontrol, dengan rata-rata 19,25 dibandingkan 16,42. Hasil ART ANOVA menunjukkan terdapat perbedaan kreativitas berdasarkan kelas dan gender, tetapi tidak terdapat interaksi signifikan antara pembelajaran dan gender. Hasil ANAVA dua jalur juga menunjukkan tidak terdapat interaksi signifikan antara pembelajaran dan gender terhadap kemampuan pemecahan masalah matematis. Dengan demikian, pembelajaran STEAM berbantuan microsite layak dan efektif digunakan sebagai inovasi pembelajaran matematika yang interaktif, kontekstual, dan inklusif.

Kata kunci: STEAM, microsite, kreativitas matematis, pemecahan masalah matematis, gender.

Abstract

This study was motivated by the need for an innovative mathematics learning approach that can improve senior high school students' mathematical creativity and problem-solving ability. This study aimed to develop STEAM learning assisted by a microsite and analyze its effect on students' mathematical creativity and problem-solving ability in terms of gender. This study used a *Research and Development* method with a *mixed-method* approach and a 4D development model consisting of *define, design, develop,* and *disseminate*. The implementation subjects were 72 eleventh-grade students of SMAN 1 Margahayu, consisting of 36 students in the experimental class and 36 students in the control class. The experimental class consisted of 14 male students and 22 female students, while the control class consisted of 17 male students and 19 female students. The experimental class received STEAM learning assisted by a microsite, while the control class received conventional learning. Data were collected through needs analysis questionnaires, teacher interviews, expert validation, student response questionnaires, documentation, and posttests on mathematical creativity and problem-solving ability. The validation results showed that the media was highly valid, with a media expert S-CVI score of 1.00 and a material expert S-CVI/Ave score of 0.95. The teacher assessment showed a feasibility percentage of 91.39%, categorized as highly feasible. The limited trial was conducted with 37 students, and 25 students completed the response questionnaire. The student response questionnaire obtained a percentage of 83.57%, categorized as good. The results showed that the creativity score of students in the experimental class was higher than that of students in the control class, with a mean score of 6.78 compared to 5.33. The mathematical problem-solving ability of students in the experimental class was also higher than that of students in the control class, with a mean score of 19.25 compared to 16.42. The ART ANOVA results showed differences in creativity based on class and gender, but no significant interaction between learning and gender. The two-way ANOVA results also showed no significant interaction between learning and gender on mathematical problem-solving ability. Therefore, STEAM learning assisted by a microsite is feasible and effective as an interactive, contextual, and inclusive innovation in mathematics learning.

Keywords: STEAM, microsite, mathematical creativity, mathematical problem-solving ability, gender.

Abstrak

Panalungtikan ieu dilatarbelakangi ku perluna inovasi pangajaran matematika anu mampuh ningkatkeun kréativitas jeung kamampuh ngaréngsékeun masalah matematis siswa SMA. Panalungtikan ieu miboga tujuan pikeun ngembangkeun pangajaran STEAM dibantuan ku microsite sarta nganalisis pangaruhna kana kréativitas jeung kamampuh ngaréngsékeun masalah matematis siswa ditilik tina gender. Panalungtikan ieu ngagunakeun métode *Research and Development* kalayan pendekatan *mixed-method* jeung modél pangembangan 4D, nyaéta *define, design, develop,* jeung *disseminate*. Subjek implementasi dina panalungtikan ieu nyaéta 72 siswa kelas XI SMAN 1 Margahayu, anu kabagi kana 36 siswa kelas ékspérimén jeung 36 siswa kelas kontrol. Kelas ékspérimén diwangun ku 14 siswa lalaki jeung 22 siswa awéwé, sedengkeun kelas kontrol diwangun ku 17 siswa lalaki jeung 19 siswa awéwé. Kelas ékspérimén meunang pangajaran STEAM dibantuan ku microsite, sedengkeun kelas kontrol meunang pangajaran konvensional. Data dikumpulkeun ngaliwatan angkét kabutuhan, wawancara guru, validasi ahli, angkét réspon siswa, dokuméntasi, sarta posttest kréativitas jeung kamampuh ngaréngsékeun masalah matematis. Hasil validasi nunjukkeun yén média kaasup kana kategori kacida validna, kalayan skor S-CVI ahli média 1,00 jeung skor S-CVI/Ave ahli matéri 0,95. Penilaian guru nunjukkeun perséntase kalayakan 91,39% kalayan kategori kacida layakna. Uji coba kawates dilakukeun ka 37 siswa, sarta 25 siswa ngeusian angkét réspon. Hasil angkét réspon siswa meunang perséntase 83,57% kalayan kategori hadé. Hasil panalungtikan nunjukkeun yén skor kréativitas siswa kelas ékspérimén leuwih luhur tibatan kelas kontrol, kalayan rata-rata 6,78 dibandingkeun 5,33. Kamampuh ngaréngsékeun masalah matematis siswa kelas ékspérimén ogé leuwih luhur tibatan kelas kontrol, kalayan rata-rata 19,25 dibandingkeun 16,42. Hasil ART ANOVA nunjukkeun aya bédana kréativitas dumasar kana kelas jeung gender, tapi henteu aya interaksi anu signifikan antara pangajaran jeung gender. Hasil ANAVA dua jalur ogé nunjukkeun henteu aya interaksi anu signifikan antara pangajaran jeung gender kana kamampuh ngaréngsékeun masalah matematis. Ku kituna, pangajaran STEAM dibantuan ku microsite layak jeung éféktif digunakeun minangka inovasi pangajaran matematika anu interaktif, kontekstual, jeung inklusif.

Kecap konci: STEAM, microsite, kréativitas matematis, kamampuh ngaréngsékeun masalah matematis, gender.

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