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# Realistic Mathematics Education (RME) Berbantuan Scaffolding untuk Meningkatkan Mathematical Reasoning


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# Pendahuluan

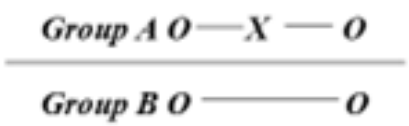
- Hasil survei PISA (Program for International Student Assessment) menunjukkan bahwa performa siswa Indonesia pada kemampuan pemecahan masalah matematis masih mengalami penurunan dari 386 menjadi 379 (OECD, 2019).
- Kemampuan siswa sekolah dasar dalam menggeneralisasi pernyataan terkait mathematical reasoning masih belum memadai (Romadhon et al., 2024).
- Integrasi mathematical reasoning dalam kurikulum sekolah dasar untuk memperkuat kemampuan pemecahan masalah siswa dianggap penting (Kaitera & Harmoinen, 2022).
- Mathematical reasoning diperlukan dalam problem solving untuk menjembatani kemampuan memahami informasi penting dengan penerapan logika dan strategi yang tepat dalam menyelesaikan masalah secara benar (Hughes et al., 2020).
- Masalah dalam RME dapat berasal dari dunia nyata, cerita fantasi, atau dunia matematika formal, selama masalah tersebut dianggap realistis oleh pikiran siswa (Inci et al., 2023).
- Scaffolding dapat memberikan dukungan bertahap untuk membantu siswa mengatasi kesulitan belajar, terutama dalam pembelajaran matematika kompleks (Liang & She, 2023; Masinading & Gaylo, 2022).

# Pertanyaan Penelitian (Rumusan Masalah)

Apakah terdapat pengaruh yang signifikan kepada siswa ketika sebelum dan sesudah implementasi RME berbantuan scaffolding untuk meningkatkan mathematical reasoning?

# Metode

- **Metode ⟶ kuasi eksperimen** dengan **desain Non-Equivalent Control Group Design**
- Desain penelitian tersebut menggunakan kelompok kontrol dan kelompok eksperimen, tetapi desainnya mungkin tidak melibatkan penugasan acak pada kelompok baik sebagian maupun seluruhnya (Creswell & Creswell, 2018)




- **Sampel** yang terlibat sebanyak 48 siswa pada kelas eksperimen dan kelas kontrol.
- **Teknik probabilistic sample** digunakan untuk memilih sampel yaitu setiap individu dalam populasi memiliki kesempatan yang sama untuk dipilih sebagai sampel (Creswell & Creswell, 2018).
- **Instrumen** yang digunakan dalam penelitian ini berupa **tes mathematical reasoning** lima soal esai. Hasil uji validitas menunjukkan nilai kurang dari 0,05, sedangkan hasil uji reliabilitas menunjukkan nilai 0,66.
- **Pengumpulan data** dalam penelitian ini menggunakan teknik **tes (pretest dan posttest)**.
- **Analisis data** skor mathematical reasoning dilakukan melalui tahapan berikut, yaitu (1) Pengambilan data; (2) Uji Normalitas; (3) Uji Homogenitas; (4) Melakukan Uji T (Independen T-Test).

# Hasil dan Pembahasan

Table 2. Test of normality

| Class | Shapiro-Wilk | | |
|---|---|---|---|
| | Statistic | df | Sig. |
| Control Class | 0.947 | 23 | 0.258 |
| Experimental Class | 0.931 | 25 | 0.094 |

$\alpha = .05$

Table 3. Test of homogeneity

| | Lavene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|
| Based on Mean | 6.084 | 1 | 46 | 0.017 |
| Based on Median | 4.121 | 1 | 46 | 0.048 |

$\alpha = .05$

- Kedua kelompok (Kelas Kontrol dan Kelas Eksperimen) memenuhi asumsi normalitas ($p$>0.05)
- Kedua kelompok (Kelas Kontrol dan Kelas Eksperimen) memiliki varian yang sama

# Hasil dan Pembahasan

Table 4. Result independent sample t-test control class

| | Control Class | n | Mean | Std. Deviation | Sig. |
|---|---|---|---|---|---|
| Mathematical Reasoning | Pre-test | 23 | 11.61 | 7.715 | 0.002 |
| | Post-test | 23 | 23.61 | 15.117 | 0.002 |

$\alpha = .05$

Table 5. Result in independent sample t-test experimental class

| | Experimental Class | n | Mean | Std. Deviation | Sig. |
|---|---|---|---|---|---|
| Mathematical Reasoning | Pre-test | 25 | 16.48 | 8.357 | 0.000 |
| | Post-test | 25 | 48.08 | 23.622 | 0.000 |

$\alpha = .05$

- Pada kelas kontrol, uji signifikansi menghasilkan nilai p sebesar 0,002 yang menunjukkan bahwa peningkatan tersebut secara statistik signifikan.
- Pada kelas eksperimen, signifikansi statistik sebesar 0,000 pada kedua tes menunjukkan bahwa perbedaan antara tes awal dan tes akhir secara statistik signifikan, menunjukkan efektivitas intervensi pembelajaran yang diberikan.

# Temuan Penting Penelitian

- RME yang didukung dengan scaffolding secara eksperimental dapat meningkatkan kemampuan penalaran matematis siswa.
- Keterampilan manipulasi matematika siswa meningkat dibandingkan dengan indikator penalaran matematika lainnya.
- Siswa mengalami kesulitan dalam membuktikan kebenaran suatu pernyataan matematis melalui argumen logis dan bukti yang kuat.

# Manfaat Penelitian

- Acuan bagi guru dalam merancang bahan ajar, terutama dalam menyusun langkah-langkah pembelajaran dengan menerapkan RME yang didukung oleh scaffolding.
- Mendukung implementasi RME yang didukung dengan scaffolding sebagai pendekatan pembelajaran praktis di sekolah dasar.
- Meningkatkan kemampuan berlogika matematis siswa secara merata.

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