

ABSTRAK

HENI MEIDA (2026). **Peningkatan Kemampuan Komunikasi Matematis dan *Self-Regulated Learning* (SRL) Siswa SMP melalui Model Pembelajaran *Flipped classroom* Berbantuan Aplikasi Cymath**

Kemampuan komunikasi matematis dan *self-regulated learning* (SRL) memiliki peranan penting dalam membantu siswa memahami serta mengomunikasikan ide-ide matematika secara efektif. Akan tetapi, kedua kemampuan tersebut masih perlu ditingkatkan dalam proses pembelajaran matematika di sekolah. Penelitian ini dilakukan untuk mengkaji peningkatan kemampuan komunikasi matematis siswa yang belajar menggunakan model *flipped classroom* berbantuan aplikasi Cymath dibandingkan dengan siswa yang memperoleh pembelajaran konvensional, menelaah perbedaan *self-regulated learning* (SRL) antara kedua kelompok, mengidentifikasi hubungan antara kemampuan komunikasi matematis dan SRL, serta meninjau efektivitas penerapan model pembelajaran tersebut. Penelitian ini menggunakan pendekatan kuantitatif dengan metode *quasi-eksperimen* dan desain *nonequivalent control group design*. Penelitian dilaksanakan di SMP Negeri 52 Bandung dengan melibatkan siswa kelas VIII-2 sebagai kelas eksperimen dan kelas VIII-3 sebagai kelas kontrol. Instrumen penelitian terdiri dari tes kemampuan komunikasi matematis dan angket *self-regulated learning* (SRL). Data yang diperoleh dianalisis melalui uji normalitas, uji *Mann-Whitney*, uji *t*, uji korelasi Spearman, serta perhitungan *effect size* sesuai dengan tujuan penelitian. Temuan penelitian menunjukkan bahwa siswa yang mengikuti pembelajaran *flipped classroom* berbantuan aplikasi Cymath mengalami peningkatan kemampuan komunikasi matematis yang lebih tinggi dibandingkan siswa yang mengikuti pembelajaran konvensional. Selain itu, *self-regulated learning* (SRL) siswa pada kelas eksperimen juga lebih baik dibandingkan kelas kontrol. Hasil analisis lebih lanjut menunjukkan adanya hubungan positif yang signifikan antara kemampuan komunikasi matematis dan *self-regulated learning* (SRL) siswa. Penerapan model *flipped classroom* berbantuan aplikasi Cymath juga memberikan pengaruh yang cukup berarti terhadap peningkatan kemampuan komunikasi matematis, sehingga dapat dikategorikan cukup efektif untuk digunakan dalam pembelajaran matematika.

Kata Kunci: kemampuan komunikasi matematis, *self-regulated learning* (SRL), *flipped classroom*, aplikasi Cymath.

ABSTRACT

HENI MEIDA (2026). *Improving Junior High School Students' Mathematical Communication and Self-Regulated Learning (SRL) Skills through the Cymath Application-Assisted Flipped classroom Learning Model*

Mathematical communication skills and self-regulated learning (SRL) play an important role in helping students understand and communicate mathematical ideas effectively. However, both skills still need to be improved in the mathematics learning process at school. This study was conducted to examine the improvement of mathematical communication skills of students who learned using the flipped classroom model assisted by the Cymath application compared to students who received conventional learning, examine the differences in self-regulated learning (SRL) between the two groups, identify the relationship between mathematical communication skills and SRL, and review the effectiveness of the implementation of the learning model. This study used a quantitative approach with a quasi-experimental method and a nonequivalent control group design. The study was conducted at SMP Negeri 52 Bandung involving students of grade VIII-2 as the experimental class and grade VIII-3 as the control class. The research instruments consisted of a mathematical communication skills test and a self-regulated learning (SRL) questionnaire. The data obtained were analyzed through normality tests, Mann-Whitney tests, t-tests, Spearman correlation tests, and effect size calculations in accordance with the research objectives. The research findings show that students who participated in flipped classroom learning assisted by the Cymath application experienced a higher increase in mathematical communication skills compared to students who participated in conventional learning. In addition, students' self-regulated learning (SRL) in the experimental class was also better than in the control class. The results of further analysis showed a significant positive relationship between mathematical communication skills and students' self-regulated learning (SRL). The implementation of the flipped classroom model assisted by the Cymath application also had a significant impact on improving mathematical communication skills, so it can be categorized as quite effective for use in mathematics learning.

Keywords: *mathematical communication skills, self-regulated learning (SRL), flipped classroom, Cymath application.*

RINGKESAN

HENI MEIDA (2026). *Ningkatkeun Kamampuh Komunikasi Matematis jeung Self-Regulated Learning (SRL) Murid SMP ngaliwatan Modél Pangajaran Flipped classroom nu dibantuan ku Aplikasi Cymath.*

Kamampuh komunikasi matematis jeung self-regulated learning (SRL) miboga peran anu penting dina mantuan murid ngartos sarta nepikeun ideu-ideu matematika sacara éféktif. Sanajan kitu, éta dua kamampuh masih kénéh perlu dironjatkeun dina prosés pangajaran matematika di sakola. Ieu panalungtikan dilaksanakeun pikeun nalungtik paningkatan kamampuh komunikasi matematis murid anu diajar ngagunakeun modél pangajaran flipped classroom nu dibantuan ku aplikasi Cymath dibandingkeun jeung murid anu meunang pangajaran konvénsional, nalungtik bédana self-regulated learning (SRL) antara dua kelompok, ngaidéntifikasi hubungan antara kamampuh komunikasi matematis jeung SRL, sarta nalungtik éféktivitas nerapkeun éta modél pangajaran. Ieu panalungtikan ngagunakeun pamarekan kuantitatif kalawan métode kuasi-eksperimén jeung désain nonequivalent control group design. Panalungtikan dilaksanakeun di SMP Negeri 52 Bandung kalawan ngalibetkeun murid kelas VIII-2 salaku kelas ékspérimén jeung kelas VIII-3 salaku kelas kontrol. Instrumén panalungtikan diwangun ku tes kamampuh komunikasi matematis jeung angket self-regulated learning (SRL). Data anu dicangking dianalisis ngaliwatan uji normalitas, uji Mann-Whitney, uji t, uji korelasi Spearman, sarta itungan effect size saluyu jeung tujuan panalungtikan. Hasil panalungtikan némbongkeun yén murid anu milu kana pangajaran flipped classroom nu dibantuan ku aplikasi Cymath ngalaman paningkatan kamampuh komunikasi matematis anu leuwih luhur dibandingkeun jeung murid anu milu kana pangajaran konvénsional. Salian ti éta, self-regulated learning (SRL) murid dina kelas ékspérimén ogé leuwih hadé dibandingkeun jeung kelas kontrol. Hasil analisis salajengna némbongkeun ayana hubungan positif anu signifikan antara kamampuh komunikasi matematis jeung self-regulated learning (SRL) murid. Nerapkeun modél pangajaran flipped classroom nu dibantuan ku aplikasi Cymath ogé méré pangaruh anu cukup bermakna kana paningkatan kamampuh komunikasi matematis, nepi ka bisa dikatégorikeun cukup éféktif pikeun digunakeun dina pangajaran matematika.

Kecap Konci: Kamampuh Komunikasi Matematis, Self-Regulated Learning (SRL), Flipped classroom, Aplikasi Cymath.