

線上討論融入數學寫作活動對國中生數學學習之影響研究

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摘 要

本研究主要在探討線上討論融入數學寫作過程對於學生數學學習成就與數學學習態度之影響，及分析學生在線上討論融入數學寫作過程中之解題想法。

本研究以台北縣某國中一年級之兩個班級學生為研究對象，其中一班為控制組，採傳統方式教學，另一班為實驗組，輔以線上討論融入數學寫作之教學活動，實驗為期一個學期。本研究採用的研究工具為研究者自編之「數學學習成就測驗」及「數學學習態度問卷」，並以 t 考驗、二因子共變數分析等方法進行資料析。

研究結果發現，接受線上討論融入數學寫作教學之實驗組學生其數學學習成就表現明顯優於接受傳統教學之控制組學生，但在數學學習態度上兩組學生並無顯著差異。此外，實驗組學生在線上討論融入數學寫作過程中之解題想法有下列六點情形：

1. 多數學生較願意在線上寫出自己的困難或意見；
2. 學生較不會評析他人的回應內容；
3. 學生不習慣在電腦上使用數學符號書寫算式；
4. 多數學生習慣使用注音文或文字表情符號；
5. 學生寫作內容出現錯別字、句子敘述不完整；
6. 學生舉例的局限性與轉譯能力不足。

最後，根據研究結果提出若干建議供教師教學及未來研究之參考。

關鍵詞：數學寫作、線上討論、國中學生

Integrating Mathematic Writing into an On-line Discussion System and a Study of its Effect on Junior High Students' Mathematic Learning

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ABSTRACT

A quasi-experimental design was used to study the effect of integrating mathematic writing into an on-line discussion system on junior high students' mathematics achievement and attitude toward mathematics. Sixty-two first graders from two different classes of a junior high school in Taipei County served as subjects. Both of the two classes were taught by the same mathematic teacher. One received the experimental treatment and the other served as the control group. An achievement test and an attitude questionnaire were designed to measure students' mathematic achievement and attitude. Finally, students' writing works were analyzed and discussed.

Research results showed that, students in the experimental group performed better in the achievement test than those in the control group. However, no significant difference of mathematic attitude was found between the two groups after the treatment.

Findings from analyzing students' writing works were as following.

1. Students are more willing to express their learning difficulties and opinions in an on-line discussion environment than in a traditional classroom.
2. Students show an incapability of evaluating other students' writing works.
3. Students are not familiar with typing mathematical symbols to communicate when they need to express their ideas in an on-line discussion system.
4. Students like to use phonetic notations or expression marks to express their ideas.
5. Students write a lot of wrong words and incomplete sentences.
6. Students often give text-like examples to explain a concept and show a lack of ability to translate between different representations.

Based on the research results, some suggestions are proposed for future studies.

Key Words: mathematical writing, on-line discussion system, junior high students