

VEE-MAPPING INTEGRAL CALCULUS



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“Transformasi Berkualiti Ke Arah Kecemerlangan”

Yang benar

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ABSTRACT

Improving student achievement in calculus is a mounting and challenging task especially when it is a prerequisite course for most the undergraduate students. Undeniably mathematics instructors have continuously faced problems of high failure rates in calculus. This study investigated the impact of Vee mapping, a creative and unique approach to an old integral problem on a sample 70 calculus undergraduate participants using an experimental-control research design. The result of t-test showed that the mean scores for Quiz and Test for the experimental group were both significantly higher than the control group. The large effect size for Quiz ($d = 2.016$) and Test ($d = 0.816$) constituted a strong supportive empirical evidence for the above result. Both values confirmed that students in the experimental group who have used Vee mapping performed significantly better in Integral Calculus than those of their counterparts in the control group at $p < .05$.

Further analysis revealed that participants who favoured using model or diagram in learning correlated moderately high ($r = .421, p < .01$) with their confidence in solving problem about integration and vice versa. Likewise, those who were confident in drawing Vee maps correlated highly with those who were confident in solving integration problems ($r = .741, p < .001$) and those who were proficient in using the Vee maps to visualize the connection between what they knew and what they could apply in doing integration ($r = .846, p < .001$) and vice versa.

The regression analysis showed “Confidence in drawing Vee maps” predicted most highly (Beta = .756, $t = 3.525, p < .05$) the “Confidence in doing integration”. Result also showed that “Beliefs” contributed significantly to students’ confidence in solving integration problems (Beta = .514, $t = 4.684, p < .05$). In other words, participants who were confident in using Vee map were confident in doing integration problem. Furthermore, those who believed that they are competent in mathematical problem solving techniques were also confident in solving integration problem.

In addition to investigating the impact of Vee mapping, this study extracted five salient factors in the Mathematics Attitude Questionnaire (MAQ). These five factors were mathematics anxiety, motivation, values, beliefs and confidence.

It is hoped that Vee mapping can be presented to more calculus students as another viable teaching and learning tool to enable more active and meaningful learning. In so doing, students' attitude must not be overlooked when introducing new techniques into the classroom. Future mathematics instructors can subsequently explore the effectiveness of such a tool through the MAQ. Lastly, it is the desire and joy to all mathematics educators to witness more learners who are successful in the Calculus course.