

The Effectiveness of Root Cause of Inventive Problems Module Based on Function Analysis on the Achievement of Invention Students

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Abstract:

Understanding invention fundamentally involves developing inventive problem identification skills (IPIS). This study investigates the impact of the Root Cause of Inventive Problem-Solving Identification module (MP), utilizing Function Analysis from the Theory of Inventive Problem-Solving Skills (TRIZ), on Form Four secondary school students' ability to identify the root cause of a problem in an invention subject. Employing a quantitative research approach with a quasi-experimental design, pre- and post-test instruments were administered to both a treatment group (TG) and a control group (CG). Descriptive analysis and inferential methods (ANCOVA and T-test) were employed for data analysis. A total of 124 students from four national secondary schools in the State of Johor participated, with two schools assigned to each group (TG and CG). The study reveals a significant difference in students' IPIS achievement before and after implementing the MP module based on Function Analysis. The pre-test analysis for CG yielded a mean value of 37.66, indicating a failing level of IPIS, while TG scored a mean value of 39.73. The ANCOVA test ($F(1,124) = 21736.62, p = 0.00, (p < 0.05)$) revealed post-test results of 39.32 for CG and 65.15 for TG, significantly demonstrating the treatment's effectiveness. The study suggests that implementing the MP module, grounded in Function Analysis, aids teachers in providing effective teaching aids for the topic of invention and offers students a robust foundation for mastering IPIS. In summary, Form Four Invention students benefit from the Function Analysis-based MP module as a tool for mastering IPIS.

Keywords:

Invention, Function Analysis, Root Cause, Inventive, module.