

Nama : AHMAD ADNAN BIN MOHD SHUKRI  
No. Matrik : M20162002165

**PEMBINAAN DAN KESAN MODUL CELIK STEM TERHADAP  
PENCAPAIAN SAINS, PEMIKIRAN KREATIF, DAN  
GAYA KREATIVITI MURID TINGKATAN SATU**

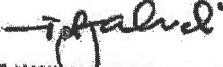
**ABSTRAK**

Kajian ini bertujuan membina dan menentukan kesan Modul Celik STEM terhadap pencapaian sains, pemikiran kreatif, dan gaya kreativiti murid. Kajian ini menggunakan pendekatan kuantitatif yang terdiri daripada dua peringkat utama. Peringkat pertama melibatkan reka bentuk pembangunan bagi membina Modul Celik STEM dan peringkat kedua menggunakan reka bentuk kuasi eksperimen bagi menentukan kesan modul yang dibina. Seramai 60 orang murid tingkatan satu dari sebuah sekolah berasrama di daerah Baling, Kedah dipilih sebagai responden melalui pensampelan rawak berkelompok. Responden terdiri daripada 30 orang murid kumpulan rawatan dan 30 orang murid kumpulan kawalan. Modul yang dibina disahkan oleh lima orang pakar dengan indeks kesahan .90. Tiga jenis instrumen digunakan adalah ujian pencapaian sains, ujian pemikiran kreatif dan soal selidik gaya kreativiti yang masing-masing memperoleh indeks kesahan .96, .94 dan .96 serta kebolehpercayaan .87, .90 dan .90. Data dianalisis melalui statistik deskriptif dan inferens. ANCOVA sehalu menunjukkan perbezaan yang signifikan antara kedua-dua kumpulan terhadap skor ujian pasca pencapaian sains [ $F(1,57) = 25.181, p = .000$ ] dan skor ujian pasca pemikiran kreatif [ $F(1,57) = 16.639, p = .000$ ] apabila skor ujian pra dikawal secara statistik. ANOVA sehalu bagi pengukuran berulang mengesahkan perbezaan yang signifikan terhadap empat gaya kreativiti murid kumpulan rawatan sebelum dan selepas lapan minggu intervensi dilaksanakan iaitu percaya kepada proses tanpa sedar [ $Wilks' Lambda = .751, F(1,29) = 9.599, p = .004$ ], menggunakan teknik [ $Wilks' Lambda = .804, F(1,29) = 7.063, p = .013$ ], menggunakan individu lain [ $Wilks' Lambda = .437, F(1,29) = 37.393, p = .000$ ] dan mengawal persekitaran/regulasi tingkah laku sendiri [ $Wilks' Lambda = .782, F(1,29) = 8.081, p = .008$ ]. Analisis korelasi *Pearson* menunjukkan tidak terdapat hubungan yang signifikan antara pemikiran kreatif dengan pencapaian sains bagi kumpulan rawatan ( $r = .220, p = .243$ ) dan kumpulan kawalan ( $r = .308, p = .098$ ) dan antara pemikiran kreatif dengan gaya kreativiti bagi kumpulan rawatan ( $r = .294, p = .115$ ). Kesimpulannya, penggunaan Modul Celik STEM dalam PdP dapat meningkatkan pencapaian sains, pemikiran kreatif dan gaya kreativiti murid dengan signifikan. Implikasinya, Modul Celik STEM yang mengetengahkan pendekatan STEM sebagai salah satu strategi PdP boleh digunakan para guru bagi meningkatkan lagi kefahaman murid dalam mata pelajaran Sains.

  
Tandatangan Dekan/ Timbalan Dekan

PROFESSOR DR. ILYAS BIN MD ISA  
Deputy Dean (Academic and International)  
Faculty of Science and Mathematics  
Universiti Pendidikan Sultan Idris

Tandatangan Penyelia

  
PROF. MADYA DR. CHE NIZAM CHE AHMAD  
Laborator Biologi  
Fakulti Sains dan Matematik  
Universiti Pendidikan Sultan Idris  
35900 Tanjung Malim, Perak

Nama : AHMAD ADNAN BIN MOHD SHUKRI  
No. Matrik : M20162002165

**DEVELOPMENT AND THE EFFECT OF CELIK STEM MODULE ON  
SCIENCE ACHIEVEMENT, CREATIVE THINKING, AND CREATIVITY  
STYLES AMONG FORM ONE STUDENTS**

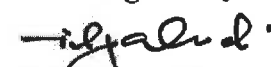
**ABSTRACT**

This study aims to develop and determine the effect of Celik STEM Module on students' science achievement, creative thinking, and creativity styles. This study employs a quantitative approach that consist of two main stages. The first stage involves developmental design to develop the Celik STEM Module while the second stage uses quasi-experimental design to determine the effect of the developed module. A total of 60 form one students from a boarding school in Baling, Kedah were chosen as respondents through cluster sampling method. Respondents composed of 30 students in treatment group and 30 students in control group. The developed module had been validated by five experts with validity index of .90. Three instruments employed were science achievement test, creative thinking test and creativity style questionnaires with validity index of .96, .94 and .96 and reliability index of .87, .90 and .90 respectively. Data were analysed using descriptive and inferential statistics. One-way ANCOVA showed significant difference between the two groups on post test scores of science achievement [ $F(1,57) = 25.181, p = .000$ ] and post test scores of creative thinking [ $F(1,57) = 16.639, p = .000$ ] while controlling pre test scores statistically. One-way repeated measures ANOVA revealed significant difference on four creativity styles based on time point before and after eight weeks of intervention for the treatment group, which were belief in unconscious processes [Wilks' Lambda = .751,  $F(1,29) = 9.599, p = .004$ ], use of techniques [Wilks' Lambda = .804,  $F(1,29) = 7.063, p = .013$ ], use of other people [Wilks' Lambda = .437,  $F(1,29) = 37.393, p = .000$ ] and environmental control/ behavioural self-regulation [Wilks' Lambda = .782,  $F(1,29) = 8.081, p = .008$ ]. A Pearson correlation analysis showed no significant relationship between creative thinking and science achievement for treatment group ( $r = .220, p = .243$ ) and control group ( $r = .308, p = .098$ ) and between creative thinking and creativity styles of the treatment group ( $r = .294, p = .115$ ). In conclusion, the use of Celik STEM Module in teaching and learning can significantly improve science achievement, creative thinking, and creativity styles of students. As implication, Celik STEM Module that highlights STEM approach as one of the teaching and learning strategies can be used by teachers to enhance students' understanding of Science.

  
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PROFESSOR DR. ILLYAS BIN MD ISA  
Deputy Dean (Academic and International)  
Faculty of Science and Mathematics  
Universiti Pendidikan Sultan Idris

**Tandatangan Penyelia**

  
PROF. MASVILAR CHE NIZAM CHE AHMAD  
Jabatan Biologi  
Fakulti Sains dan Matematik  
Universiti Pendidikan Sultan Idris  
35900 Tanjung Malim, Perak