

## **Mathematics Learning Inventory: Early Indicator Based on Mathematics Interest & Self Esteem**

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### **ABSTRACT**

One of the most significant subjects taught worldwide from preschool through university level is mathematics. The students' interest is considered as a vital aspect affecting involvement and success in this subject. In addition, self-esteem also has been seen as an important factor in learning mathematics. Therefore, mathematics interest and self-esteem are two critical elements that contribute to mathematics achievement. Besides their SPM result, there is insufficient indicator to identify low achiever students. Hence, the innovation from this study is an indicator called Mathematics Learning Inventory (MLI) which consists of google form and score excel template. Based on the results from the inventory, we can identify which students need consultation related to the course based on the score. Concurrently, the system will notify the instructor to provide intervention procedures in preparing them for the formative and the summative assessment for that subject. This MLI can be introduced and utilized by all institutions which offered pre-university programme. This study will use purposive sampling technique to select a sample of 312 sciences students from Centre for Foundation Studies (CFS), International Islamic University Malaysia (IIUM) who are taking Mathematics 1 (MAT0114) subject in semester 1, 2022/2023. Academic Interest Scale for Adolescents (AISA) is the instrument used in order to measure Mathematics interest whereas Rosenberg Self-Esteem Scale is used to measure self-esteem.

**Keywords.** Pre-university programme; Mathematics interest; Self-esteem; Mathematics Learning Inventory (MLI).





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## C051: MATHEMATICS LEARNING INVENTORY (MLI)



DEPARTMENT OF MATHEMATICS, CENTRE FOR FOUNDATION STUDIES (CFS) IUM, GAMBANG, PAHANG.



### PROBLEM



Result from **PISA 2009** showed that **60%** of Malaysian students **below the minimum** benchmarks of the mathematical literacy. (Ministry of Education, 2013)



In **PISA 2012**, mathematics performance was **subpar** again, and Malaysia was placed 52nd out of 65 participating countries. (OECD, 2014)

### RESEARCH QUESTIONS



How can we **measure** the **students' interest** and **self-esteem** in **Mathematics**?



How to **improve students' performance** in **Mathematics** based on the **interest** and **self-esteem**?

### OBJECTIVES



To **examine** students with **low mathematics interest** and **self-esteem**.



To **recommend** intervention steps in **helping students** to learn Mathematics.

### METHODOLOGY

#### 1) Students fill in questionnaire



Mathematics Learning Inventory (MLI)

Assalamualaikum wrt. wbt & Good Day,  
Dear B! & S:  
Congratulations and welcome to our campus.  
This survey is to get early indicator on student's mathematics interest and self-esteem.  
Please be informed that the content of this questionnaire is guided by the University Policies be assured that the data you provide as part of this survey will be treated as CONFIDENTIAL. Your responses will only be used for the purposes as stated.  
We deeply appreciate your kind contribution and assistance. Thank you.  
balqish@ium.edu.my (not shared) Switch account  
\* Required

STUDENT ID \*  
Your answer  
SECTION / GROUP \*  
Your answer  
GENDER \*  
☐ Male  
☐ Female

#### 2) Transform the responses to MLI template

MATRIC NO	SECTION	GENDER	PROG	COURSE CODE	EMOTION					KNOWLEDGE					SELFESTEEM										TOTAL EMOTION	TOTAL KNOWLEDGE	TOTAL RSE	SCORE	AVERAGE LIKERT SCALE	REMARK											
					5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5							5	5	5	5	5	5	5	5			
					E_1	E_2	E_3	E_4	E_5	E_6	E_7	K_1	K_2	K_3	K_4	K_5	K_6	K_7	RSE_1	RSE_2	RSE_3	RSE_4	RSE_5	RSE_6							RSE_7	RSE_8	RSE_9	RSE_10							

#### 3) Table visualization via MLI

MLI Score: **Low** (Score 1-2), **Moderate** (Score 3), **High** (Score 4-5)

MATRIC NO	SECTION	GENDER	PROG	COURSE CODE	EMOTION					KNOWLEDGE					SELFESTEEM										TOTAL EMOTION	TOTAL KNOWLEDGE	TOTAL RSE	SCORE	AVERAGE LIKERT SCALE	REMARK																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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### OUTPUT

Categorized the students according to MLI:

**Low** (Score 1-2),  
**Moderate** (Score 3),  
**High** (Score 4-5)

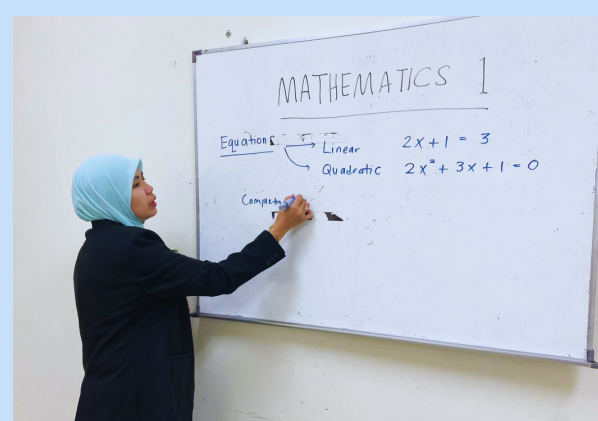
### OUTCOME

Plan necessary action to **help** low score students

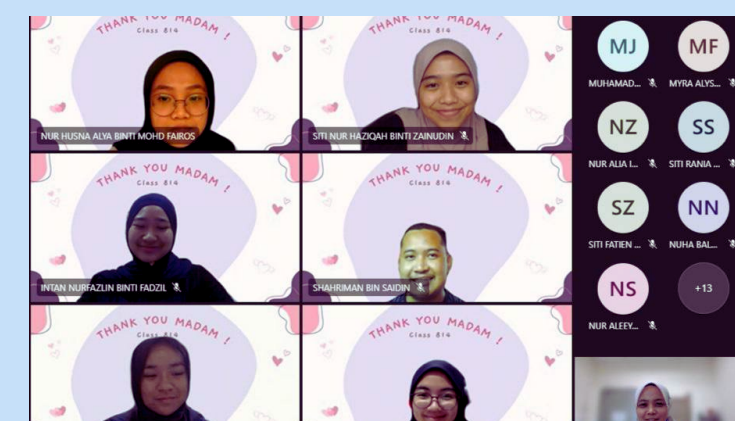
#### a) One-to-one session



#### b) Remedial Class



#### c) Online Class



### NOVELTY



#### Questionnaire aided assessment

Alternative way to determine the low, moderate or high score students other than using assessment in class.



**Develop** a **user-friendly format template** to assess students' interest and self-esteem in Mathematics.

### IMPACT



#### Advantage for students:

Increase the students' motivation to study Mathematics and improve their result.

### INNOVATION

#### Questionnaire:

SCAN ME



MLI presentation:



SCAN ME



### SUSTAINABILITY



Offering **support and resources** such as **one to one tutor** to **sustain** their **interest** and **self-esteem** in **Mathematics**.

### COMMERCIALIZATION



MLI can be **introduced and utilized** by **all institutions** which offer pre-university programme.