



MINISTRY OF EDUCATION, CULTURE, RESEARCH AND TECHNOLOGY  
UNIVERSITAS NEGERI MALANG (UM)  
FACULTY OF MATHEMATICS AND NATURAL SCIENCES

Jalan Semarang 5, Malang 65145

Phone: +62 (0) 341-551312

Web: [www.fmipa.um.ac.id](http://www.fmipa.um.ac.id)

Our ref. : 2.8.13/UN32.3.5.5/TU/2023

August 2, 2023

Subject : Invitation letter for the invited speaker of ICoMSE 2023

To

Prof. Dr. Endang Susantini, M.Pd  
Universitas Negeri Surabaya

Dear colleague,

It is our pleasure to announce that the Department of Science Education, Universitas Negeri Malang hosts the **7<sup>th</sup> International Conference on Mathematics and Science Education** with the theme "*Science and Mathematics Education Research for Sustainable Development*".

The event will be held in on-site mode on August 14-15, 2023. Therefore, we would like to invite you to be the **invited speaker** on **August 14, 2023**. Please kindly share the information to the institution network and appoint representative(s) to become the participants for the ICoMSE. In addition to the ICoMSE, there will be an International Short Course on STEM Education and International Competition on Mathematics and Science Learning Innovation that your students can participate in at the same period during the ICoMSE. For more information regarding the events, please check the attached poster. For your information, we will only charge half price for students from your university under your recommendation.

Look forward to your coming and your students' participation in the events.

Chairman,

Habiddin, Ph.D

NIP 19791213200811012



Excelsior in  
Learning Innovation

MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY  
UNIVERSITAS NEGERI MALANG (UM)  
STATE UNIVERSITY OF MALANG  
FACULTY OF MATHEMATICS AND NATURAL SCIENCES  
Jl. Semarang 5, Malang 65145 Phone: +62 (0) 341-551312 Web: <http://icomse.fmipa.um.ac.id/>



# CERTIFICATE

No: 15.8.1/UN32.3/TU/2023

This is to certify

**Prof. Dr. Endang Susantini, M. Pd.**

As the  
**Invited Speaker**  
of a paper entitled

**"The Android-based HOTS Assessment App for Science and Mathematics  
(EduAssess App) in Junior High Schools: Evaluating the instrument validity"**

In the 7<sup>th</sup> International Conference on Mathematics and Science Education  
"Science & Mathematics Education Research For Sustainable Development"  
organized by the Faculty of Mathematics and Natural Sciences, Universitas Negeri Malang  
August 14<sup>th</sup> - 15<sup>th</sup>, 2023, Malang, Indonesia



FMIPA Prof. Dr. Hadi Suwono, M.Si.  
NIP. 196705151991031007





# THE ANDROID-BASED HOTS ASSESSMENT APP FOR SCIENCE AND MATHEMATICS (EDUASSESS APP) IN JUNIOR HIGH SCHOOLS: EVALUATING THE INSTRUMENT VALIDITY

7th International Conference on Mathematics and Science Education

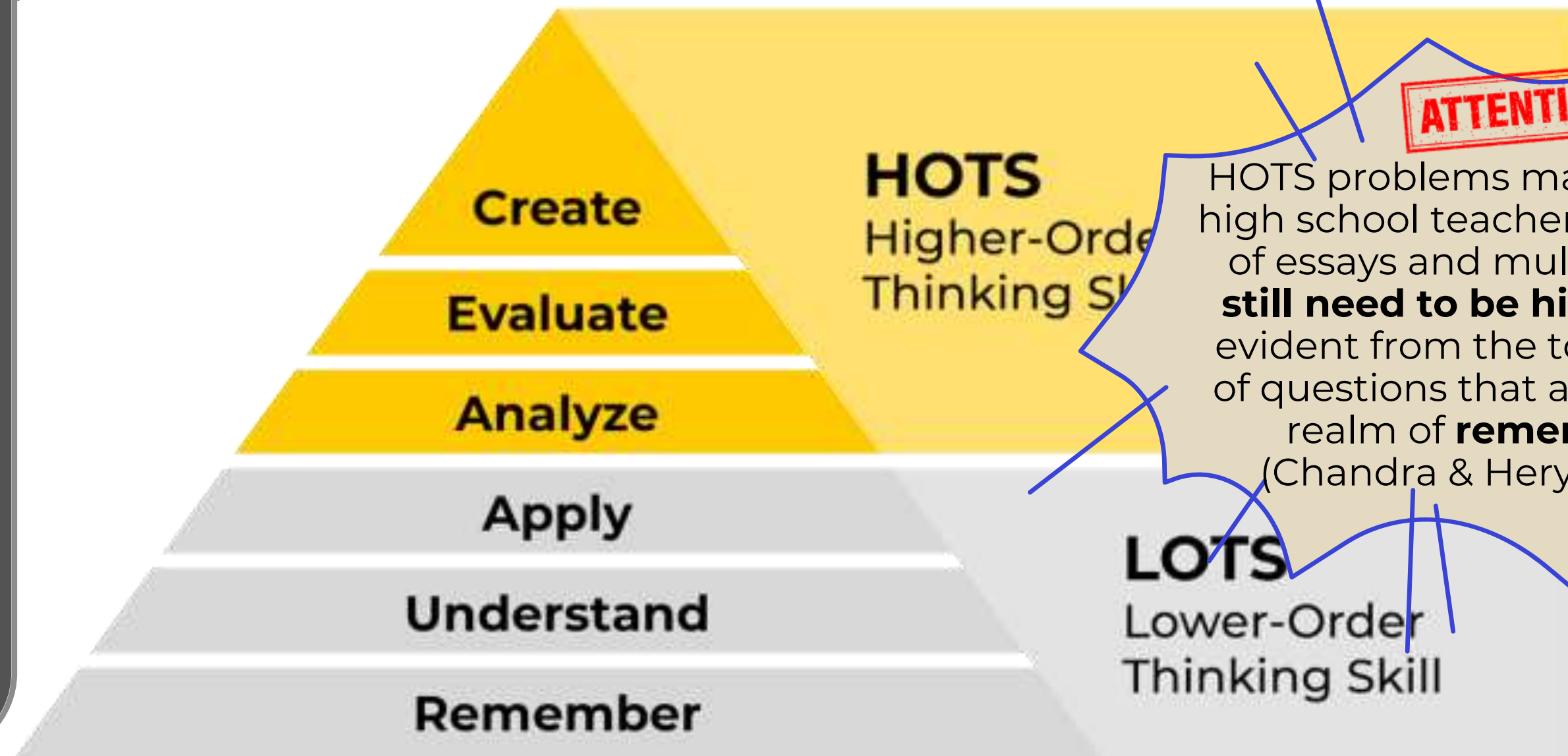
**PRESENTED BY**

Prof. Dr. Endang Susantini, M.Pd.  
Dr. Yurizka Melia Sari, M.Pd.  
Prima Vidya Asteria, S.Pd., M.Pd.  
Muhammad Ilyas Marzuqi, M.Pd





The Ministry of Education and Culture created a program to **improve learning quality and increase graduates' quality.**



**ATTENTION**

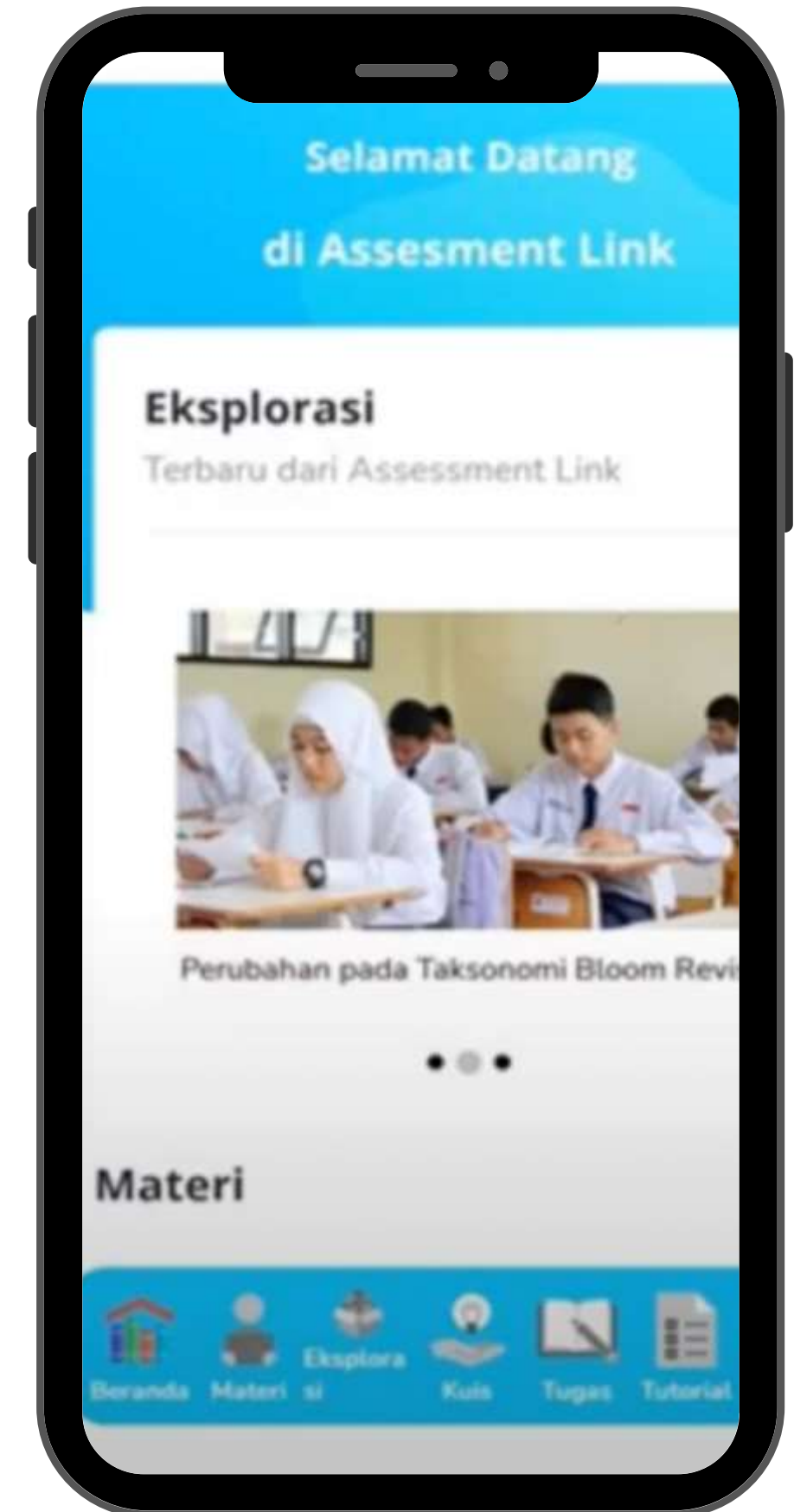
HOTS problems made by junior high school teachers in the form of essays and multiple choice **still need to be higher.** This is evident from the total number of questions that are still in the realm of **remembering** (Chandra & Heryadi, 2020)

## BACKGROUND OF THE STUDY

Relevant Research

Assessment Link  
(Susantini, 2022)

- The Assessment-Link application is useful for **practicing analysis skills on biology tests based on the Revised Bloom Taxonomy**
- This application was developed because **there are obstacles for students and college students to integrate the dimensions between cognitive processes and knowledge.**
- In addition, a few prospective biology teachers still **need help determining the cognitive level of test questions based on the revised Bloom's Taxonomy.**
- This application was developed based on Android because many students and teachers **have gadgets to facilitate use.**

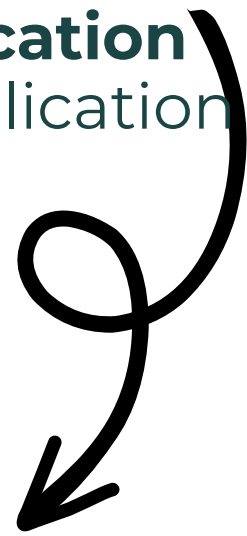


# PROBLEM STATEMENT

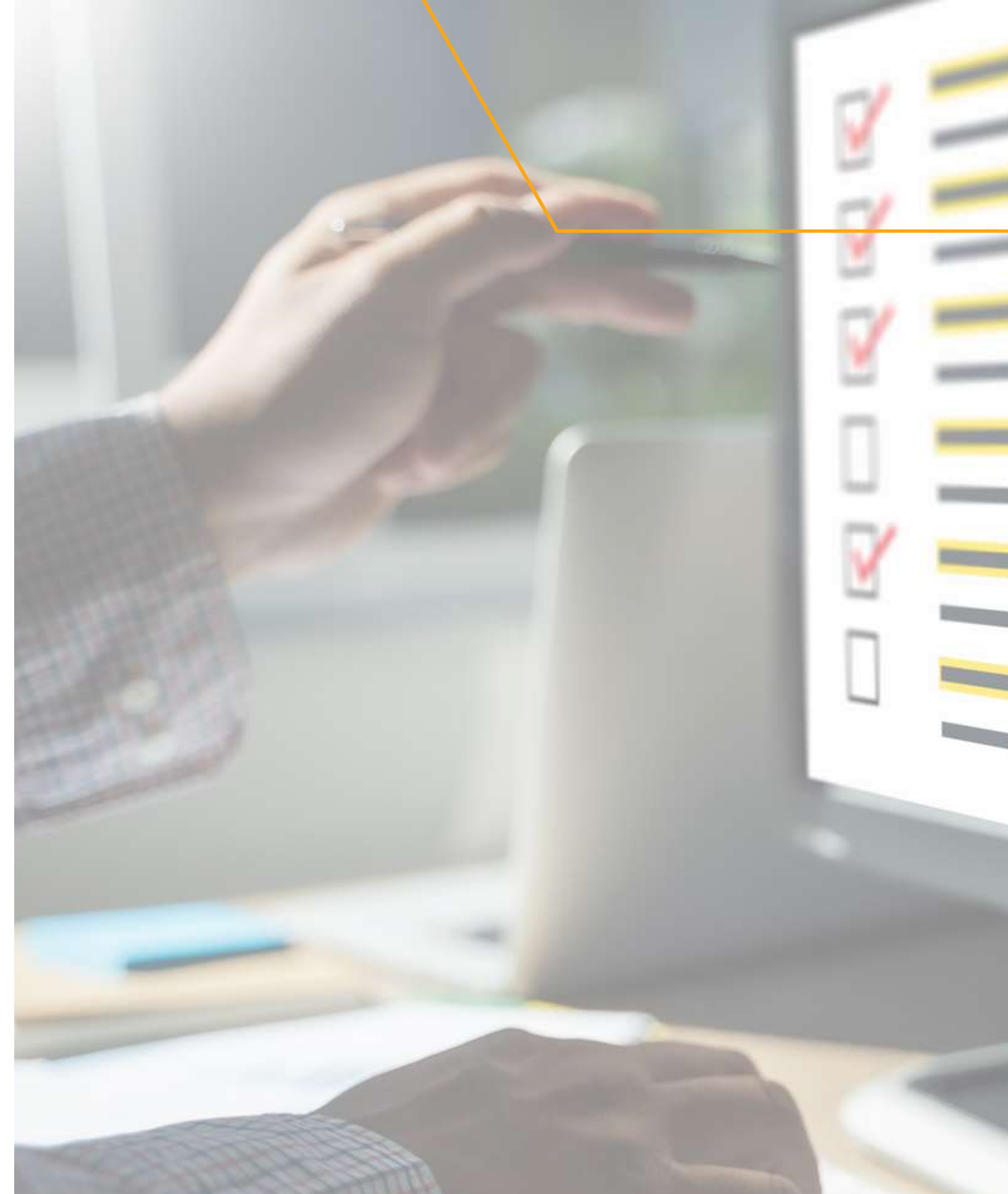
It is necessary to research the development of an **android-based e-Assessment application** to facilitate junior high school **teachers making Bloom's taxonomy problem, especially those focusing on Higher Order Thinking Skill (HOTS).**

The specific objectives of the research to be carried out are to analyze the feasibility of the e-assessment application which consists of:

- **Validity of the e-assessment application**
- Practicality of the e-assessment application



**Expert Judgement  
Aiken vs Gregory**



# METHODOLOGY

## R & D

This research is research and development (R & D), which aims to develop Bloomian HOTS in Science and Mathematics (EduAssess). The research procedure is carried out through three stages, namely:

- (a) planning,
- (b) try out, and
- (c) measurement and interpretation.

# FRAMEWORK

This framework is used as a diagnostic of junior high school teachers' ability to solve HOTS problems.

Bloomian HOTS	Problems Type	Mathematics			Science		
		7th	8th	9th	7th	8th	9th
Analysis	Multiple Choice	3 items	3 items	3 items	3 items	3 items	3 items
Evaluate	Multiple Choice	3 items	3 items	3 items	3 items	3 items	3 items
Create	Essay	3 items	3 items	3 items	3 items	3 items	3 items



# CONTENT VALIDITY



The content validation is carried out by expert judgment by filling in the validation sheet. The sheet was composed with interval scale of 1 to 4. The data analysis of the validation questionnaire was done in one by the following steps

## THE FORMULA OF AIKEN'S V INDEX

$$V = \frac{\sum s}{[n(c - 1)]}$$

- $s = r - l_o$
- $l_o$  = lowest validity score
- $c$  = highest validity score
- $r$  = score by given rater

The V index value ranges from 0 to 1.  
***The closer an item is to 1, the better it is because it is more relevant to the indicator***

# CONTENT VALIDITY



## EXPANDED GREGORY INDEX

The expert agreement index for content validity is a comparison of the numbers of items from two experts as validators with strong relevance to the overall items category (Gregory, 2007)

Table 2. The relevance category scoring with three expert judgements

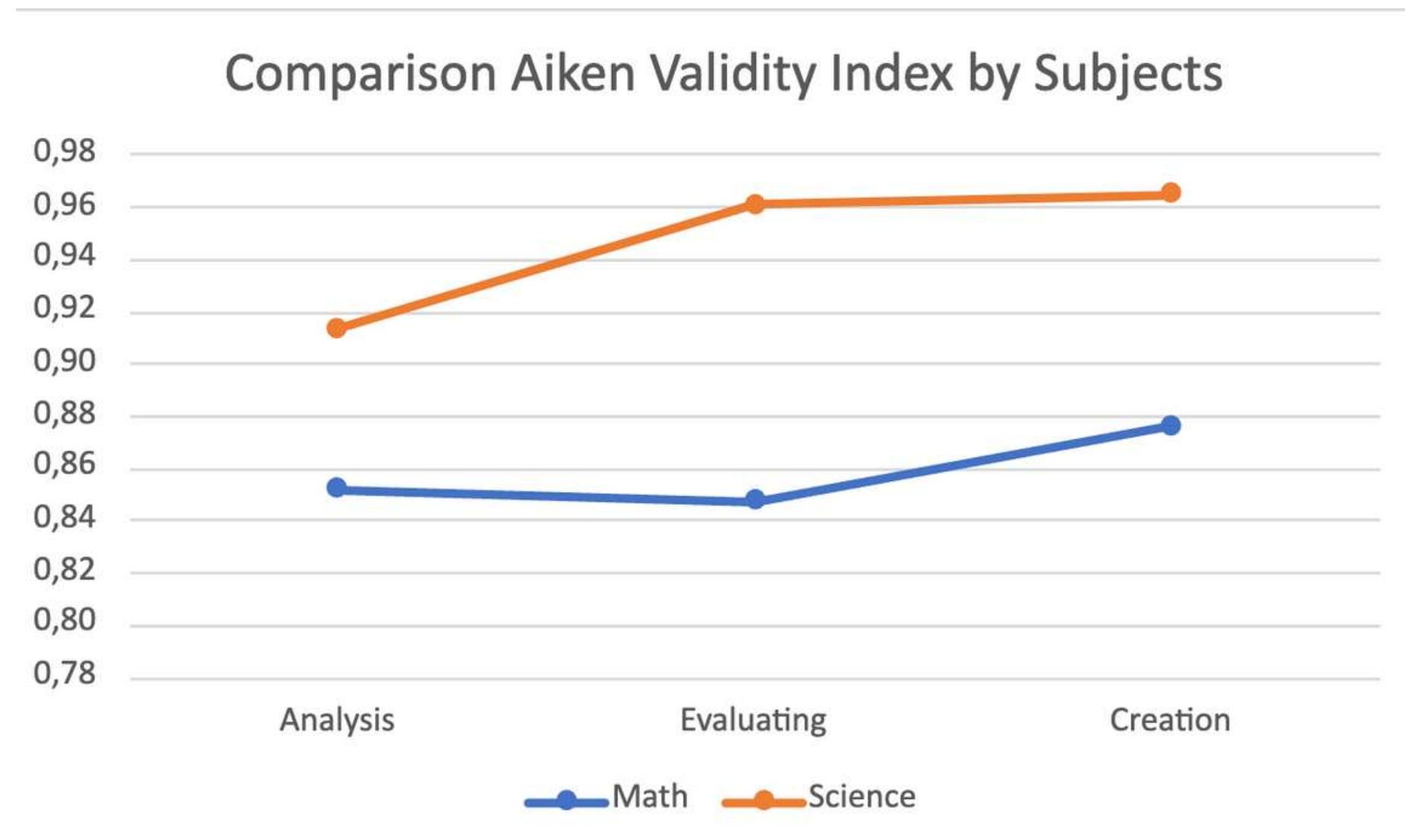
Expert 1	Weak	Weak	Weak	Weak	Strong	Strong	Strong	Strong
Expert 2	Weak	Weak	Strong	Strong	Weak	Weak	Strong	Strong
Expert 3	Weak	Strong	Weak	Strong	Weak	Strong	Weak	Strong
Total	A	B	C	D	E	F	G	H

$$\text{Content validity coefficient} = \frac{H}{(A+B+C+D+E+F+G+H)}$$

The Gregory index value ranges from 0 to 1.  
***The closer an item is to 1, the better it is because it is more relevant to the indicator***

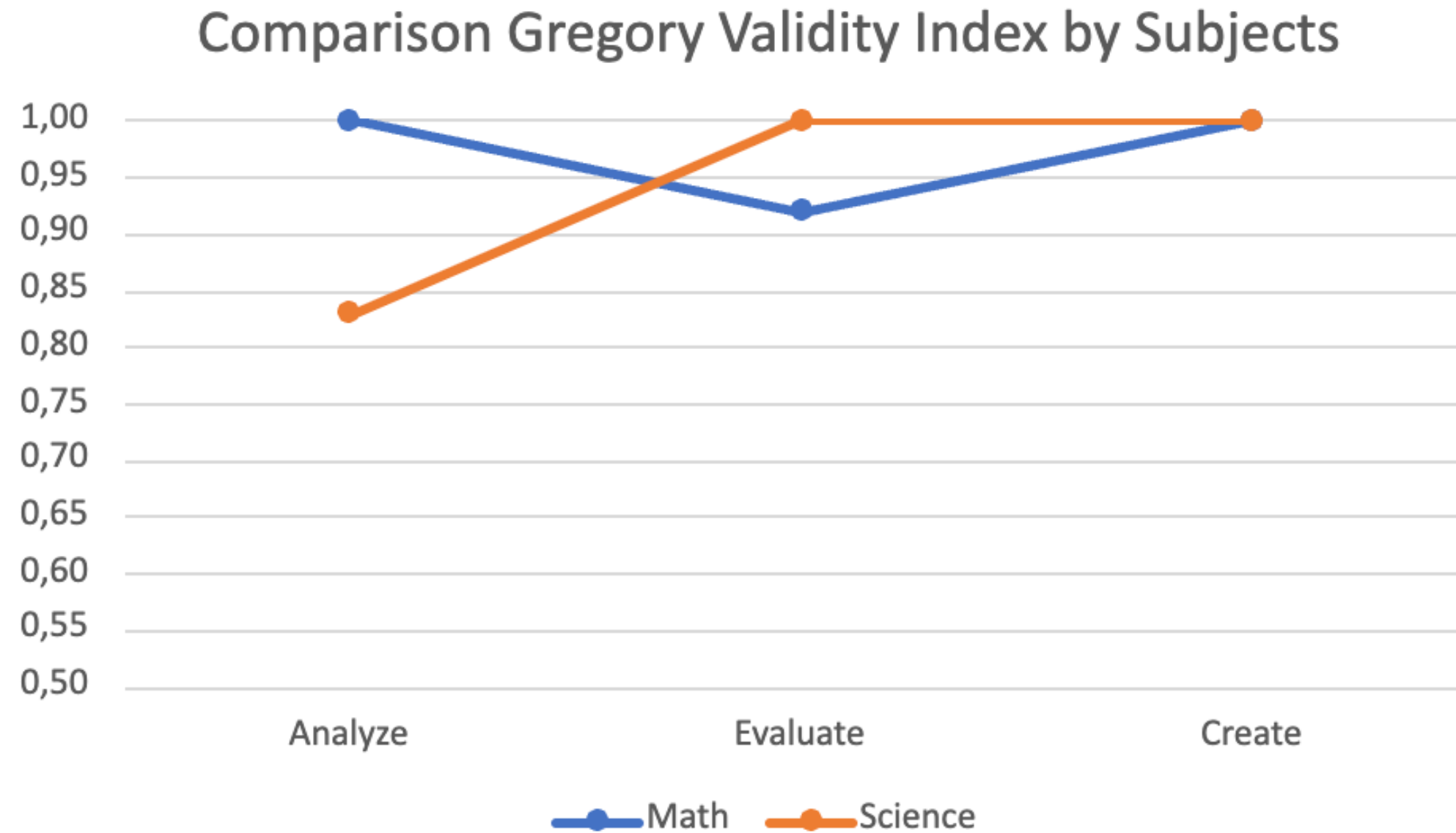
# AIKEN INDEX

The comparison between Mathematics and Science Bloomian HOTS



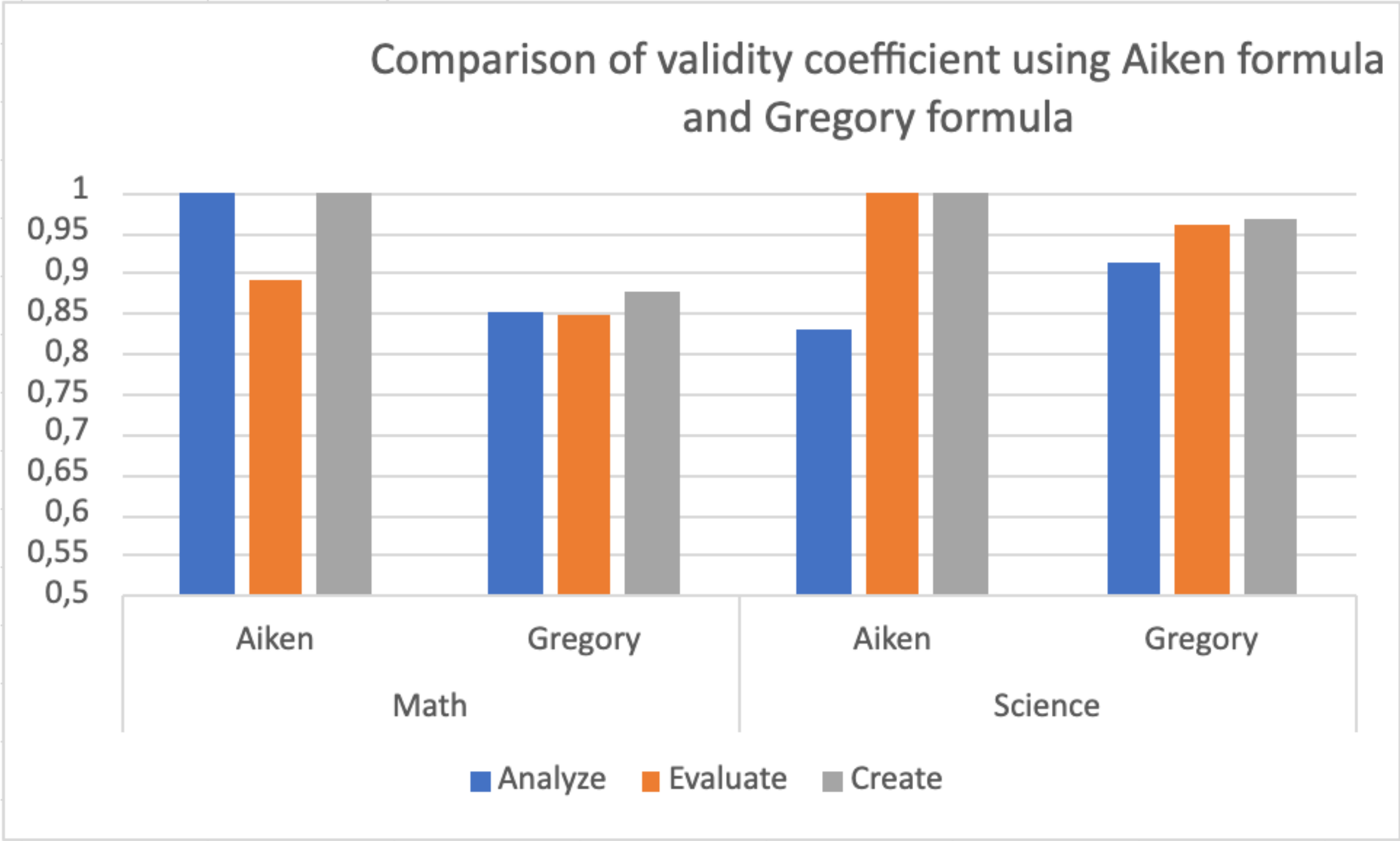
# GREGORY INDEX

The comparison between Mathematics and Science Bloomian HOTS



# AIKEN VS GREGORY INDEX

The comparison between Mathematics and Science Bloomian HOTS





- It can be obtained that the results of the validity coefficient calculation using **Gregory's formula are more stable than using Aiken's formula.**
- From its form, this result shows that the validity coefficient calculated using **Gregory's formula on HOTS problems is higher than the validity coefficient calculated with Aiken's validity.**
- Some future research projects can be done are the stability of the number of expert judgments. **Further research is needed on the number of expert judgments to maximize the acquisition of the index or the coefficient.** It is better done on both the Aiken formula and the Gregory formula.

خَيْرُ النَّاسِ أَنْفَعُهُمْ لِلنَّاسِ

"The best of mankind is the most beneficial to mankind" (HR. Ahmad)





ANY

QUESTION