

IMPLEMENTATION OF VIDEO BASED TRAINING FOR SCIENCE TEACHERS' PROFESSIONAL DEVELOPMENT: IMPROVING TEACHERS' COMPETENCIES IN CRITICAL THINKING INSTRUCTION AND ASSESSMENT (A CASE STUDY)

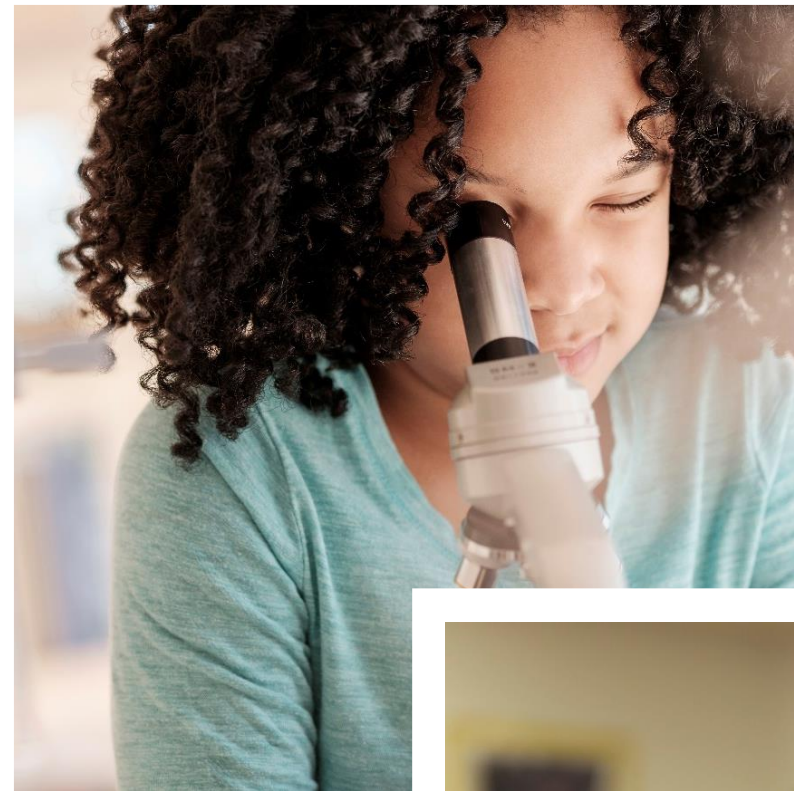
I. PRIHASTUTI, A. WIDODO, LILIASARI, RIANDI



UNIVERSITAS PENDIDIKAN INDONESIA (UPI)

BACKGROUNDS

- CRITICAL THINKING IS A CORE LIFE SKILL, ONE OF THE 21ST CENTURY SKILLS
- SCIENCE LEARNING STANDARDS ARE EMPHASIZING ON CRITICAL THINKING SKILLS
- SCIENCE LEARNING IS INCREASINGLY FOCUSED ON FACTS, DECREASING THE INQUIRY PROCESS
- DOMINANCE OF QUESTIONS IN C1 AND C2 LEVEL, RARELY ON C4 AND C5 LEVELS
- TEACHERS NEED TO USE VARIETY OF STRATEGIES TO IMPROVE STUDENTS CRITICAL THINKING SKILLS
- VIDEOS PROVIDE A MORE CONCRETE OVERVIEW OF TEACHING PRACTICE, CAN BE STORED DIGITALLY, AND SUITABLE FOR A LARGE NUMBER OF PARTICIPANTS
- **VIDEO BASED TRAINING AS AN ALTERNATIVE STRATEGIES IN TEACHERS PROFESSIONAL DEVELOPMENT TO IMPROVE TEACHERS' COMPETENCIES IN IMPLEMENTING CRITICAL THINKING INSTRUCTION AND ASSESSMENT**



Research Questions

1. How is the teachers competency on designing critical thinking instruction after participating in video-based training?
2. How is the teachers competency on implementing critical thinking instruction after participating in video-based training?
3. How is the teachers competency on assessing critical thinking skills after participating in video-based training?

Methodology

MIXED METHODS

Exploring teacher's competencies in designing, implementing and assessing critical thinking instruction

VIDEO DEVELOPMENT

Dec 2019 - Sept 2020
5 topics : 33 segments

CRITICAL THINKING SKILLS

FQ, AAr, AAQ, JCR, JOR, DI, IAs, and DA
(Ennis, 1967)

PARTICIPANTS & COACH

4 science teachers
(T1, T2, T3, and T4)
A coach: teacher trainer with 10 years experiences

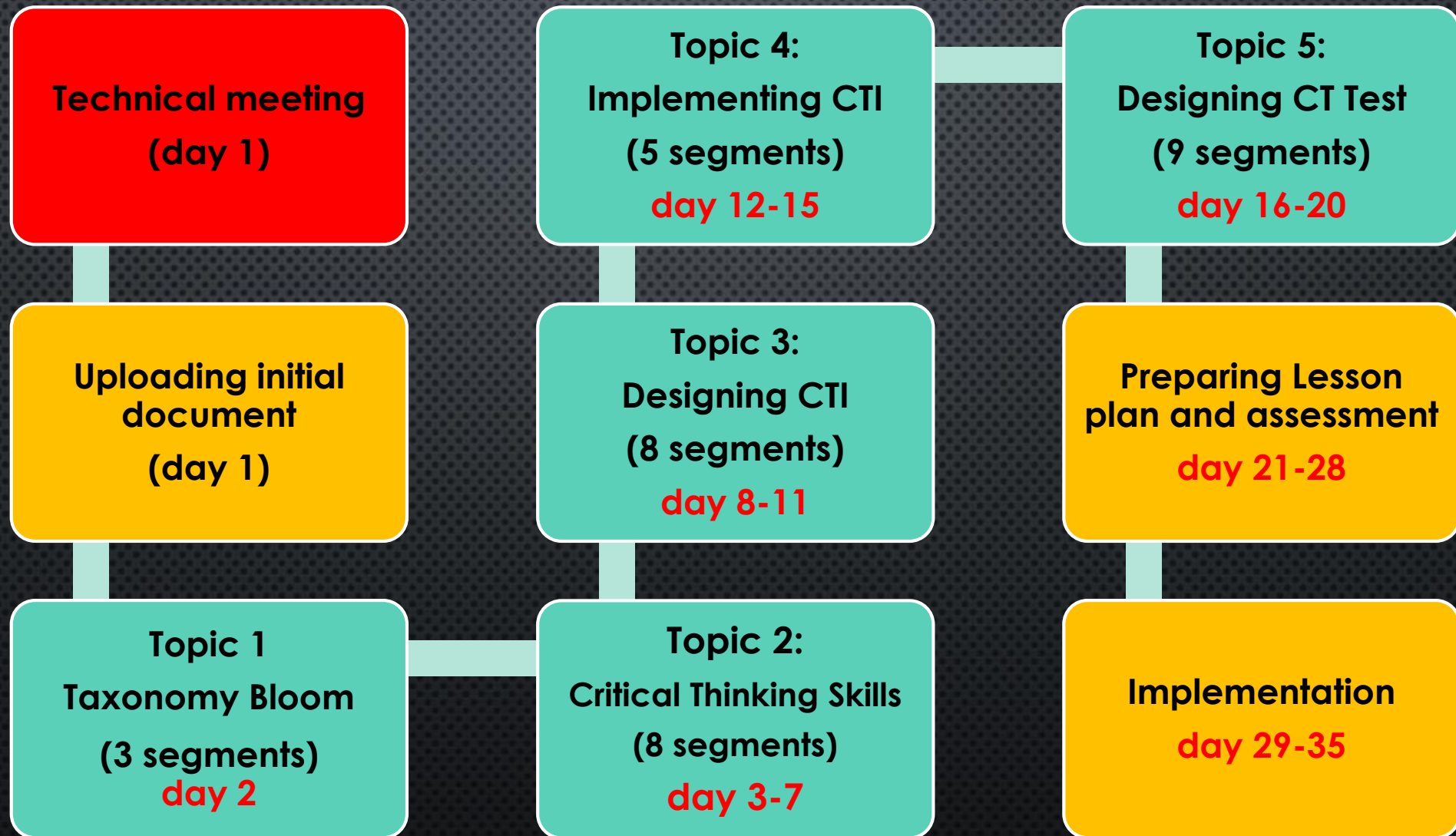
TEHNICAL PROCEDURES

fill in the registration link and join the google classroom using the given class code
Participating the program for 5 weeks

DATA COLLECTION & INSTRUMENTS:

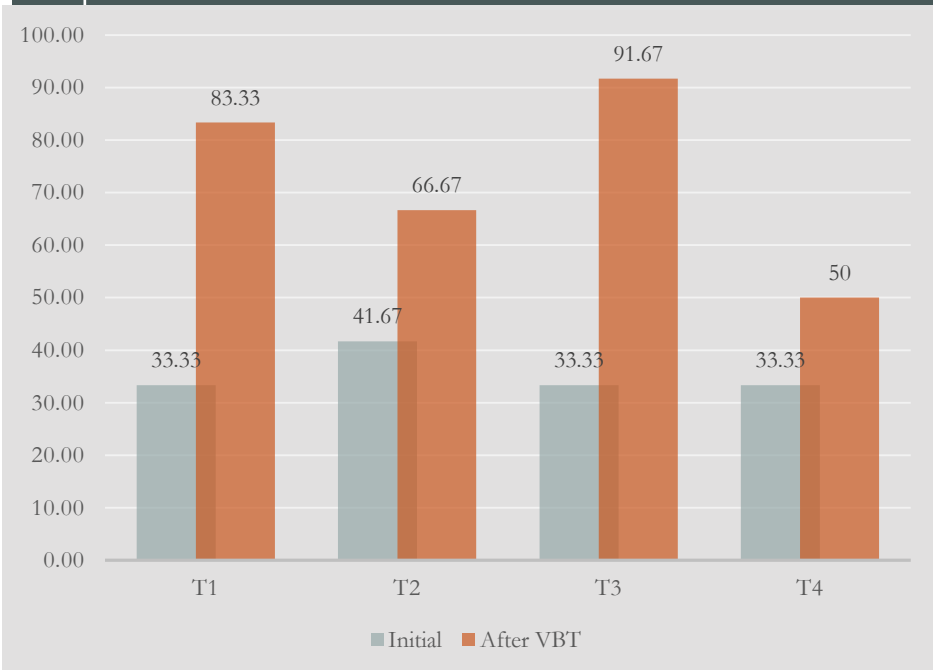
Lesson plan, test instruments, evidence of implementation
Teachers worksheets and scoring rubrics

VIDEO BASED TRAINING PROCEDURES



RESULTS

Teachers competency on designing critical thinking instruction



- **BEFORE:** LEARNING OBJECTIVES AND ACTIVITIES DID NOT REFLECT CTS, UNCLEAR ASSESSMENT PLAN

- **AFTER:** , THE TEACHERS ARE ABLE TO INSERT CTS INTO LEARNING OBJECTIVES, LEARNING ACTIVITIES AND ASSESSMENT

- CTS AND SCIENCE CONCEPTS ARE WELL INTEGRATED (T1 & T3)

- LEARNING ACTIVITIES DIDN'T INCLUDE ALL LEARNING OBJECTIVES (T1)

- CTS AND SCIENCE CONCEPTS DIDN'T WELL INTEGRATED (T4)

- LEARNING ACTIVITY FOCUSES ONLY ON CTS (T2)

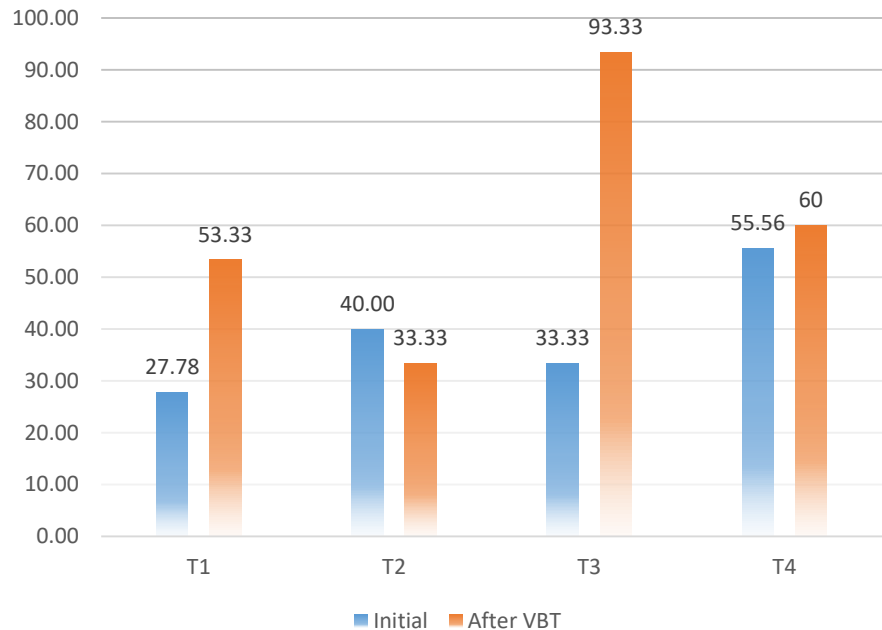
Overview of teacher lesson plans after participating in VBT

Teacher	Good things from lesson plan	Improvement needed
T1	Providing stimulus from credible and less credible articles, students need to analyse the information contained in the article, CTS and science concept are well integrated	Stimulus to encourage students to make focused questions Congruence between learning objectives and learning activities
T2	Learning activities explain in detail how the stages of encouraging students to make focused questions	Teachers only focused on achieving CTS Stimulus only suitable for achieving CTS but are not related to main concept
T3	CTS and science concept are well integrated The can make students understand about concepts (electrical circuits) as well as CTS (Deciding on action)	Only one CTS practised by teacher. Teachers should integrate at least two CTS in one lesson plan
T4	Learning objectives and activities are very detail	CTS and science concept are not well integrated. teacher prepares two kind of worksheet : worksheet for obtaining science concept and for practicing CTS

not all learning objectives can be achieved

RESULTS

Teachers competency on implementing critical thinking instruction



- **BEFORE:** LEARNING ACTIVITIES DID NOT REFLECT CTS, STUDENTS ACTIVITIES ONLY TRANSFERRING INFORMATION FROM BOOKS/VIDEO TO THEIR WORKSHEET
- **AFTER:** STUDENT WORKSHEETS CONTAIN ACTIVITIES THAT CAN PRACTICE STUDENT CBC

- CTS AND SCIENCE CONCEPTS DIDN'T WELL INTEGRATED (T1, T2, T4)
- DISCREPANCY BETWEEN LEARNING OBJECTIVES AND IMPLEMENTATION (T2)

TEACHER 3

- CTS AND SCIENCE CONCEPTS ARE WELL INTEGRATED (T3)
- KNOWLEDGE AND CTC CAN BE ACHIEVED SIMULTANEOUSLY

Sample of students worksheet from Teacher 3

CTS : Deciding an
action

Problem

Electrician will install an electrical installation in a store. The store owner provides two cables with different types of conductor wire. Cable A uses Copper type and Cable B uses Aluminum type. For an installation using cable A, you will need a 10m cable, while for an installation using cable B, you will need an 8m cable. The store owner asking the Electrician that this electrical installation should have lowest resistance. Let's help electrician to determine what type of cable to use!

To help Electrician, answer these folowwing questions!

1. What criteria you will use to select the cable type with low resistance?
2. What information do you need to get about wire A and wire B to produce an electrical installation with low resistance?

Look for as much information as possible through books or other sources to answer points 1 and 2

3. Write down the advantages and disadvantages of each choice of cable type by filling in the following table!

No.	Type of cable	Advantages	Disadvantages
1.	A		
2.	B		

4. Based on point 3, determine which cable will you recommend to the electrician?
5. Express your opinion in paragraph form and read it in the next meeting via Google Meet!

RESULTS

PROBLEM FINDINGS:

- INACCURATE SELECTION OF STIMULUS, MAKING THE QUESTIONS LESS SUITABLE FOR MEASURING THE INTENDED CTS.
- THE USE OF SENTENCES IN QUESTIONS THAT MAY NOT UNDERSTAND BY STUDENTS

Teachers competency on Designing CTS test instrument

BEFORE: DOMINATED QUESTIONS ON REMEMBERING AND UNDERSTANDING, NO ANALYSING AND EVALUATING QUESTIONS

SCORE RESULTS FOR EACH CTCs QUESTIONS

Teacher	FQ	AAr	AAQ	DI	JCS	JOb	IAs	DA
T1	95,6	0	72,72	95,45	90,9	66,67	41,67	77,78
T2	100	44,44	44,44	47,22	100	88,89	66,67	44,44
T3	100	90,9	90,9	54,54	72,72	100	100	66,67
T4	66,67	-	-	33,33	88,89	-	44,44	-



Conclusion

- Video Based Training is able to improve teachers competencies on designing learning instruction and assessment that encourage students CTS
- Problems finding in integrating between CTS and topics taught, discrepancy between lesson plan and implementation
- Video materials and participants assignment, coaching process and technical implementation need to be improved

A grayscale photograph of three people in a laboratory setting. Two individuals are seated at a table, each with a microscope. A third person is partially visible on the right. The image has a dark, textured overlay. The text 'THANK YOU' is superimposed on the left side.

THANK

YOU