



**IMPROVEMENT OF
SECONDARY MATHEMATICS AND SCIENCE
EDUCATION THROUGH LESSON STUDIES
IN INDONESIA**

Tsukuba, 15-20, 2006

By

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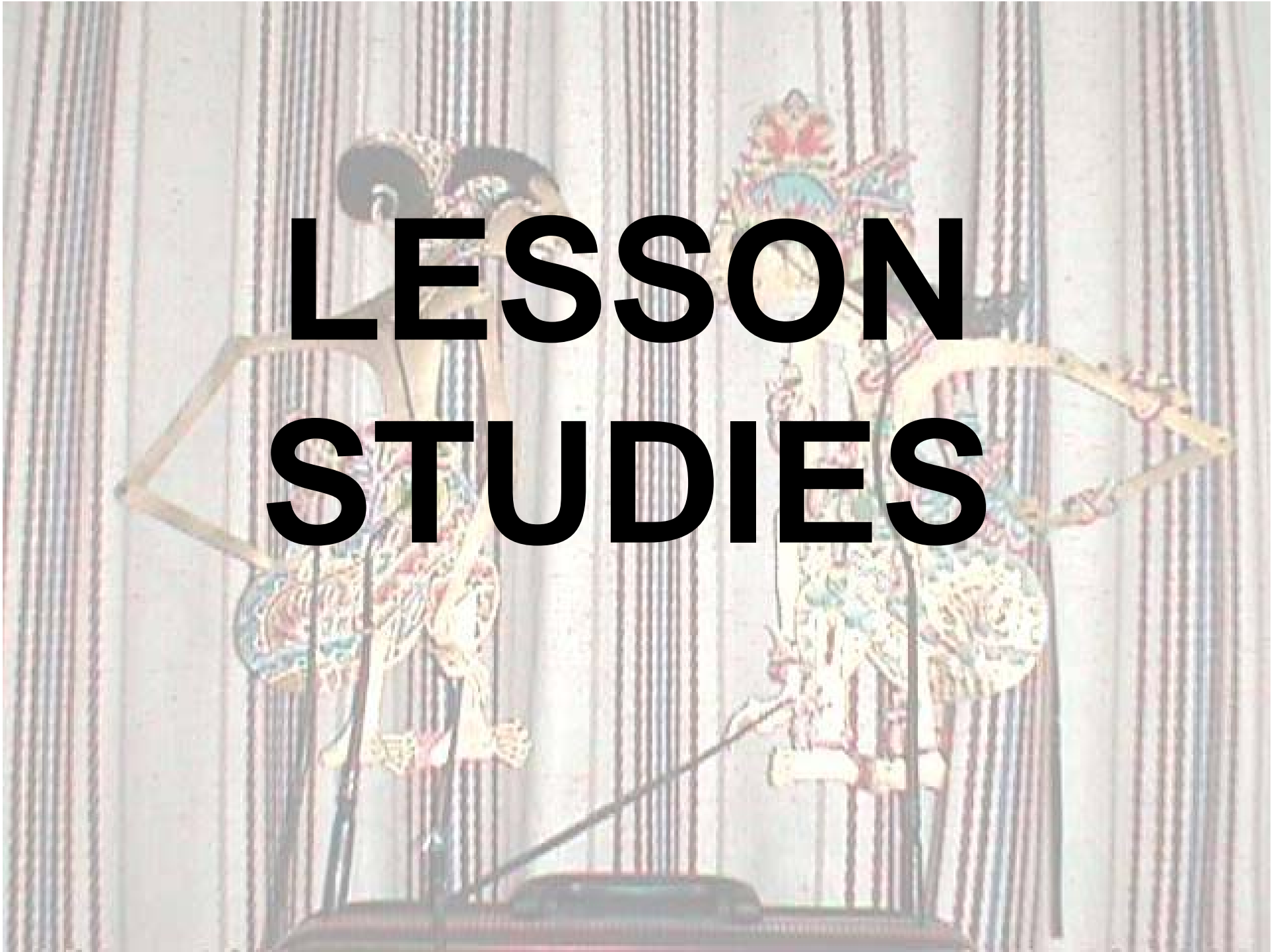


BACKGROUND AND ISSUES

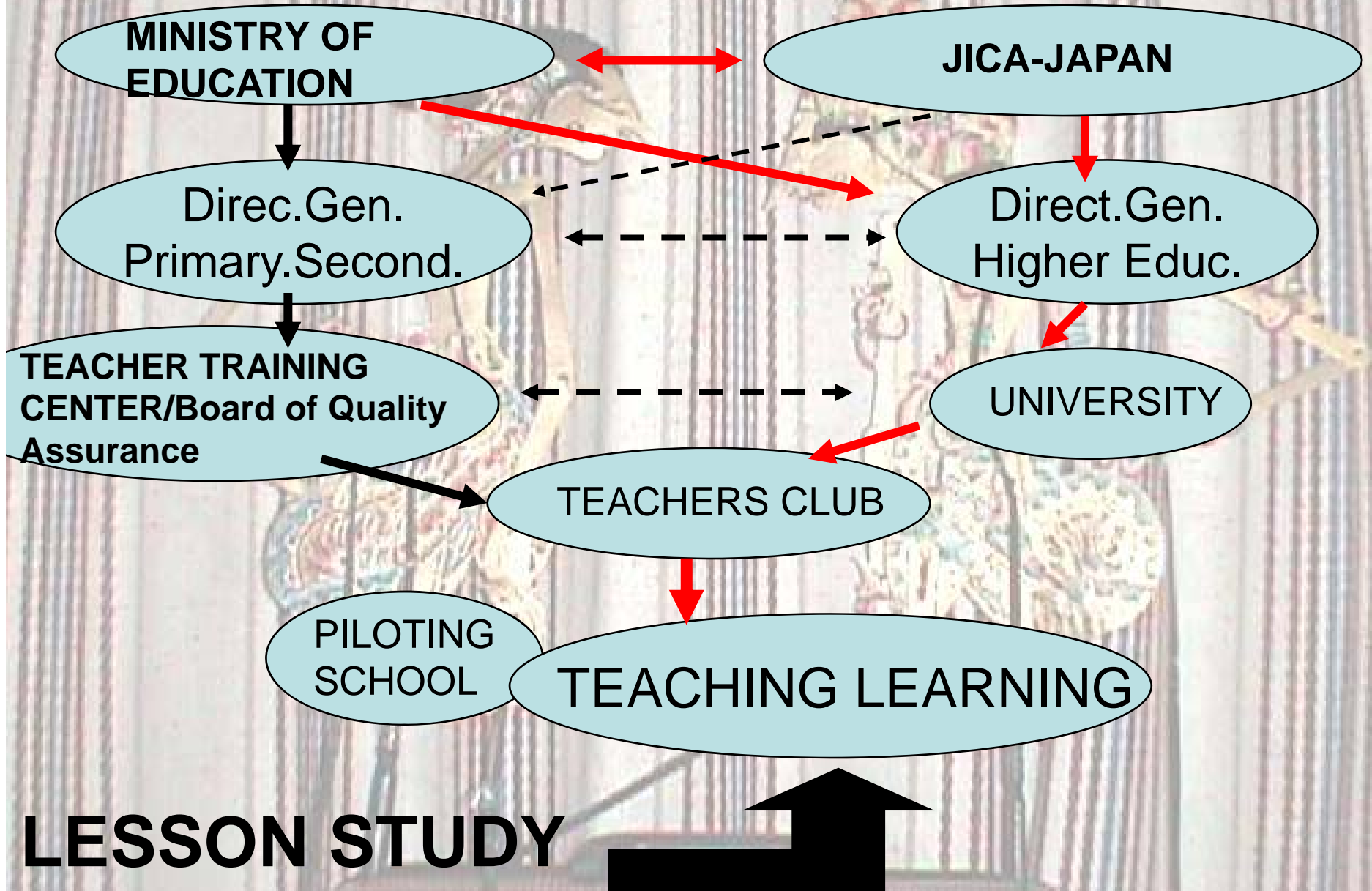
The image shows two intricately carved and painted Indonesian puppets (wayang) on a stage. The puppets are made of wood and are adorned with vibrant, multi-colored patterns and designs. They are positioned on a stage with a background of vertical stripes. The text is overlaid on the image, centered and in a bold, black font.

**Most Indonesian Teachers Still
Implement Traditional Teaching
(Video)**

LESSON STUDIES



COOPERATION AMONG VARIOUS EDUCATIONAL INSTITUTION IN INDONESIA





We define:

LESSON STUDY

**As the activities
for developing and trying
out some teaching models
at schools through
Classroom Action Research**



***Objectives of LESSON
STUDIES Activities:***

To contribute the
IMPROVEMENT of
Secondary Mathematics
and Science Education in
INDONESIA



LESSON STUDIES (2001-2003)

Collaboration Among:

JICA-Japan (IMSTEP-JICA Project)

Indonesian Ministry of Higher Education:

- 1. University of National Education (West Java)**
- 2. The State University of Yogyakarta (Central Java)**
- 3. The State University of Malang (East Java)**

Design and approach

- Preparation
- Implementation
- Reflection and exchange experience

preparation

Meeting between counterparts (universities) and school principals



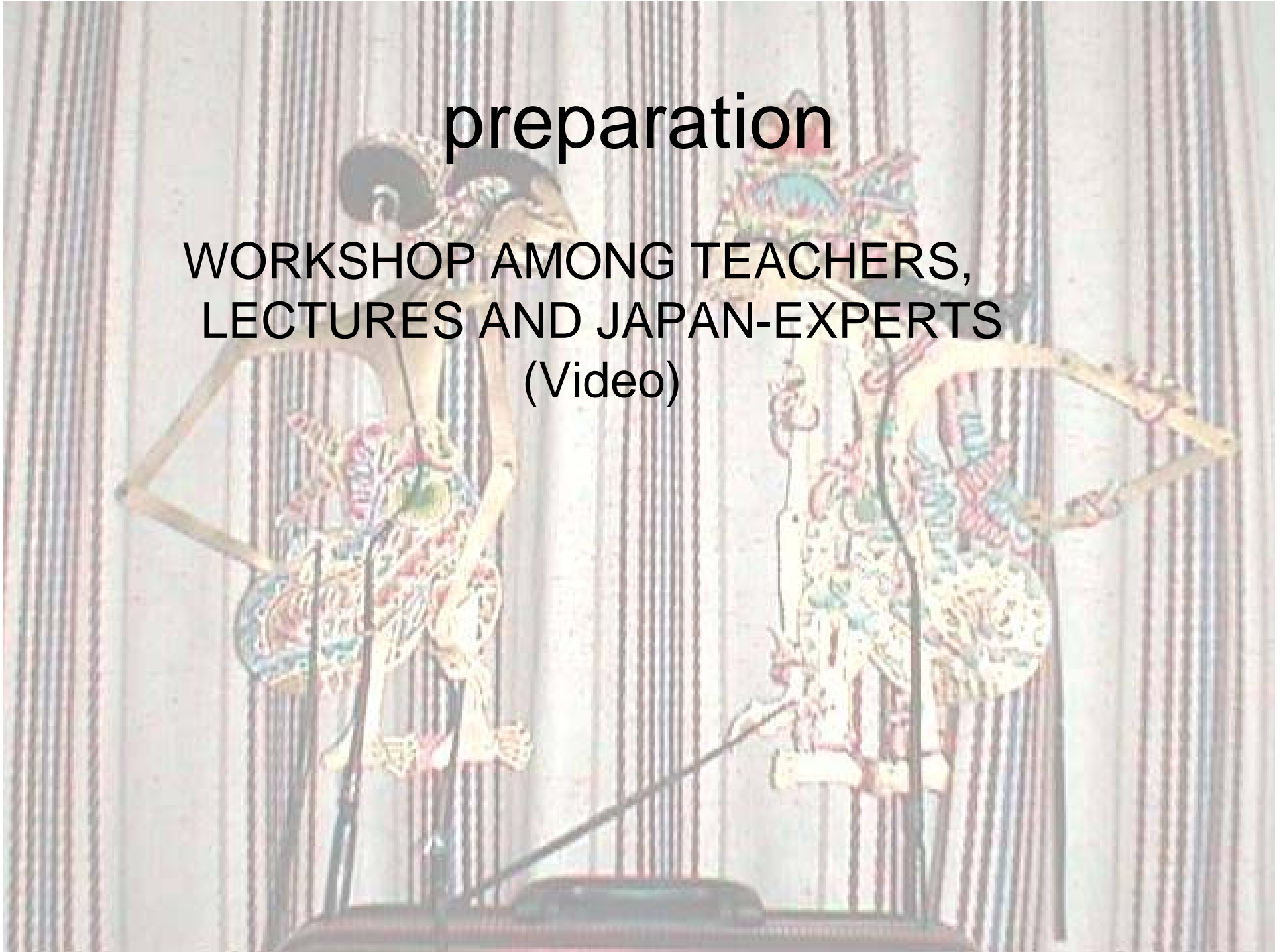
preparation

conducting workshops



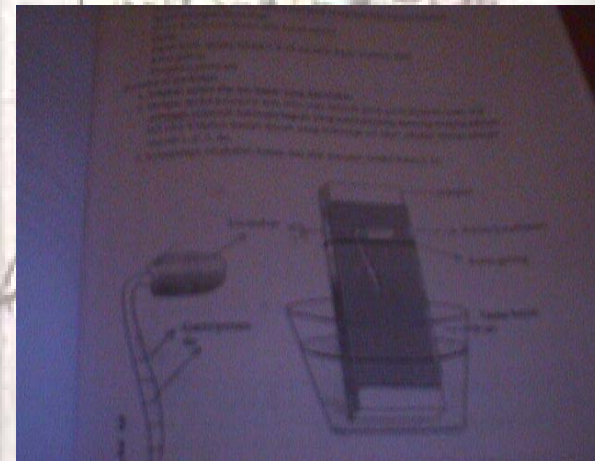
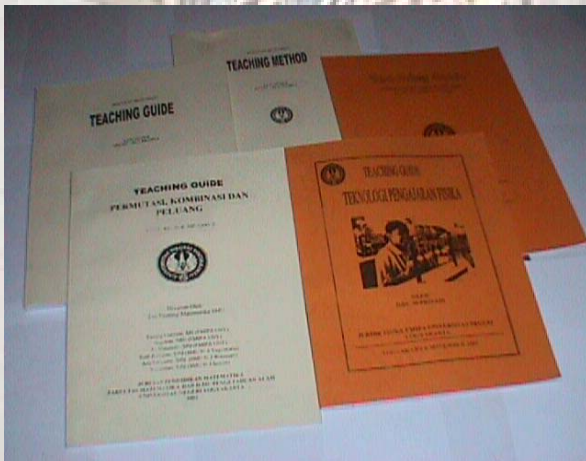
preparation

WORKSHOP AMONG TEACHERS,
LECTURES AND JAPAN-EXPERTS
(Video)



preparation

developing teaching plan, preparation of required teaching materials and worksheet



Subjects in the Lesson Studies

Junior High School			Senior High School			
Math	Physic	Bio	Math	Physics	Bio	Chem
Parallel Lines, Relations, Mapping, Graphics of the relation, Pythagorean theorem, Linear equation with 2 variables, Statistics, Function, Graphic of function, and Geometrical shapes.	Vibration & waves, Matter and its phases, Heat, Sound, Caloric conduction	Digestive system, Respiration in plants, The function of plant organ, Human respiration, Breath system, Plant reproduction, Food digestion on human being, and Cell.	Trigonometric functions, Probability, Permutation, Combination, and Trigonometry	Solar system, Linear motion, and Static electricity, The inner parts of the earth, and Lithosphere	Growth and development, Plant movement, Plant tissue, Plant organ, Reproductive organ on plant, The Generative reproduction, Connective tissue, Development on animal, Metamorphosis, and Irritability of Plant	Thermochemistry, Reaction rates, and Stoichiometry

West Java

(Bandung)

Year 2001/2002

	Junior High Schools			Senior High Schools			
	Math	Physic	Bio	Math	Physic	Bio	Chem
1. Classes (schools)	1	1	1	1	1	1	1
2. Teacher involved	1	1	1	1	1	1	1
1.Lecture involved	4	4	4	4	4	4	4

FY 2002/2003

	Junior High Schools			Senior High Schools			
	Math	Physic	Bio	Math	Physic	Bio	Chem
1. Classes (schools)	2	2	2	2	2	2	2
1. Teacher involved	2	2	2	2	2	2	2
1.Lecture involved	4	4	4	4	4	4	4

East Java

Year 2001/2002

(Malang)

	Junior High Schools			Senior High Schools			
	Math	Physic	Bio	Math	Physic	Bio	Chem
1. Classes (schools)	1	1	1	1	1	1	1
1. Teacher 2. involved	1	1	1	1	1	1	1
1. Lecture involved	4	4	4	4	4	4	4

Year 2002/2003

	Junior High Schools			Senior High Schools			
	Math	Physic	Bio	Math	Physic	Bio	Chem
1. Classes (schools)	1	1	1	1	1	1	1
1. Teacher 2. involved	1	1	1	1	1	1	1
1. Lecture involved	4	4	4	4	4	4	4

The background of the slide features two puppets on a stage. The puppets are intricately dressed in colorful, traditional attire, including headpieces and ornate clothing. They are positioned on a wooden stage with a microphone stand in the foreground. The text is overlaid in the center of the image.

***Implementation
of the Lesson
Studies Activities***

The image shows two puppets on a stage. The puppet on the left is a female figure with a large, dark, ornate headdress and a colorful, patterned costume. The puppet on the right is a male figure with a tall, multi-tiered, colorful headdress and a similar patterned costume. They are positioned on a stage with a striped background. A microphone is visible in the foreground. The text "MATHEMATICS AT SENIOR HIGH SCHOOL (Video)" is overlaid in the center of the image.

**MATHEMATICS AT SENIOR
HIGH SCHOOL
(Video)**

The image shows two puppets on a stage. The puppets are made of light-colored material, possibly wood or paper, and are dressed in colorful, traditional-looking clothing. They are positioned on a stage with a striped background. The text "SCIENCES AT JUNIOR HIGH SCHOOL (Video)" is overlaid in the center of the image.

**SCIENCES AT JUNIOR HIGH
SCHOOL
(Video)**

The image shows two colorful puppets on a stage. The puppets are made of wood and are dressed in elaborate, multi-colored costumes. They are positioned on a wooden frame that is part of a stage set. A microphone is visible in the foreground, pointing towards the puppets. The background consists of vertical wooden slats.

SCIENCES AT SENIOR HIGH SCHOOL (Video)

The image shows two puppets on a stage. The puppets are highly detailed and colorful, with intricate patterns and designs. They are positioned on either side of a central microphone stand. The background consists of vertical stripes in various colors. The text "CHEMISTRY AT SENIOR HIGH SCHOOL (Video)" is overlaid in the center of the image.

**CHEMISTRY AT SENIOR HIGH
SCHOOL
(Video)**


REFLECTION

Experts, Lectures and Teachers were discussing the arising problems and the effectiveness of the models



Teachers learned and implement new methods of teaching (Reflection/workshop)





***Results
of Lesson
Studies***



Students expressed their happiness and enthusiastic during the piloting activities due to:

- There are informal interactions
- The contents were easier to learn
- They were able to express their ideas
- They got much time to discuss with their classmates

Contextual teachings made them IMPROVE THEIR MOTIVATION TO LEARN Certain topic.



Activities in laboratories, improve student's process skills.



Hands-on activities, teaching aids and worksheets improved students' performance.



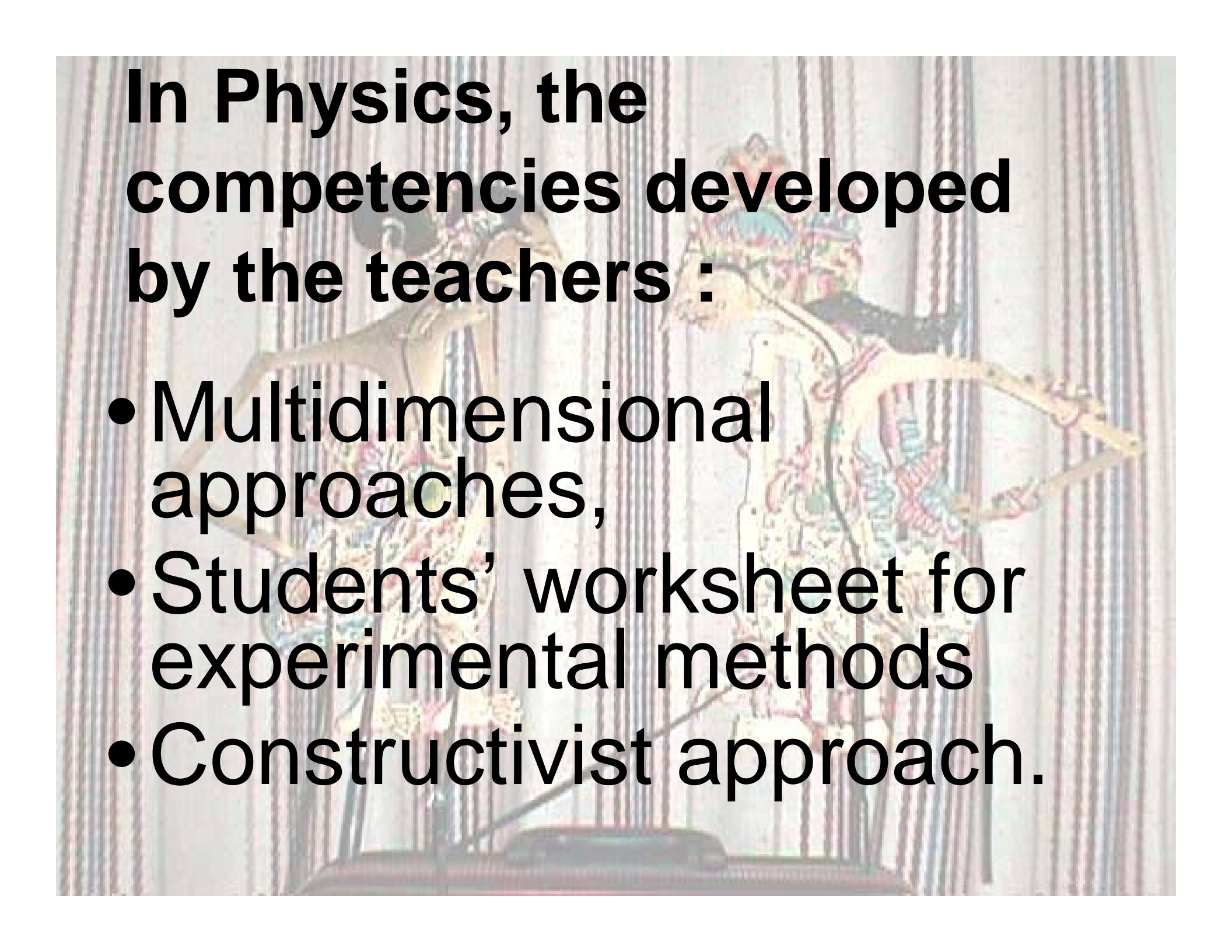
The class management were varied and flexible





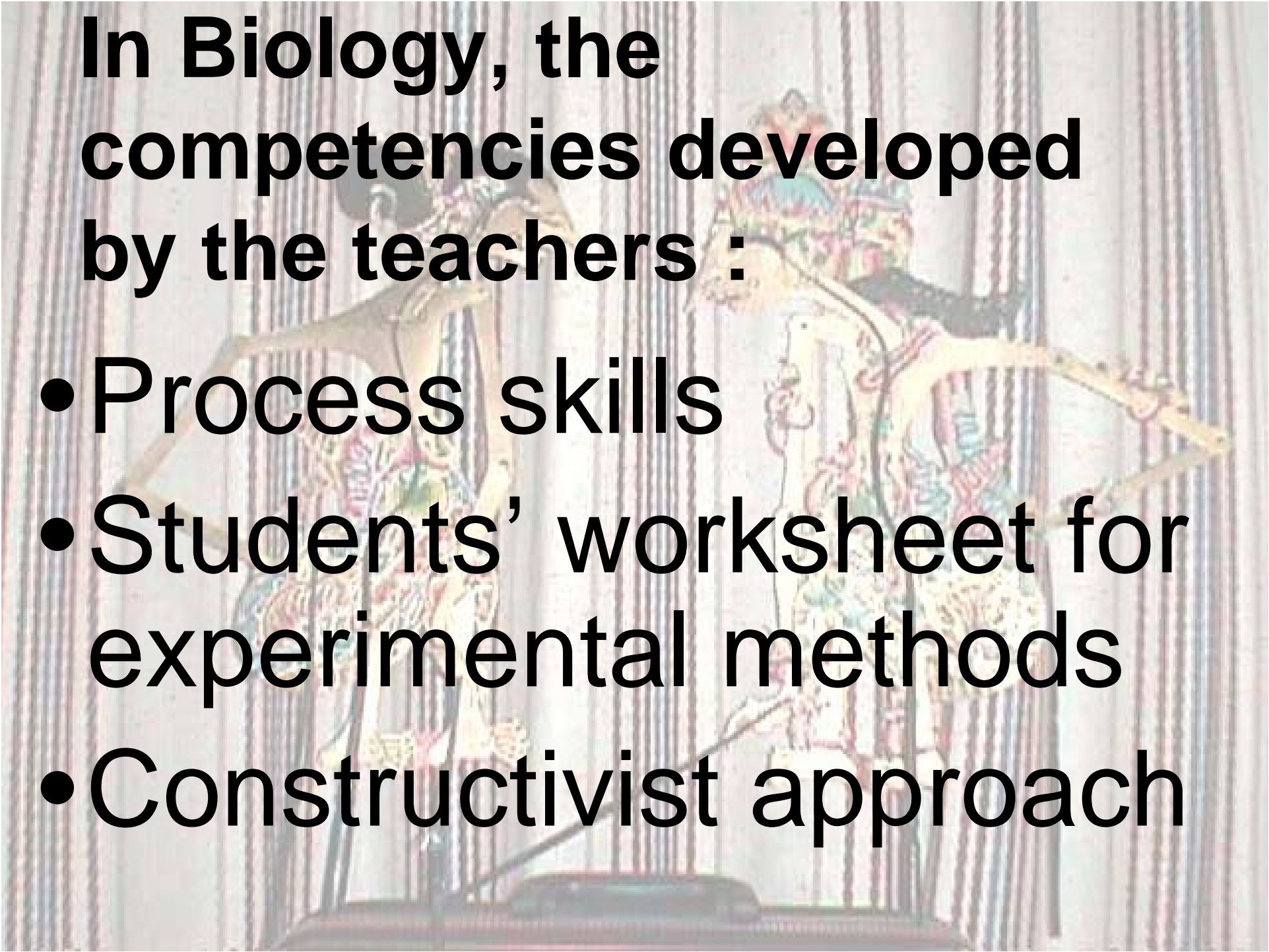
**In Mathematics, the
competencies developed
for teachers :**

- **Realistic approaches**
- **Authentic assessment**
- **Constructivist approach.**

A background image of a physics laboratory. In the center, a pendulum is suspended from a stand, with a bob swinging. The background is slightly blurred, showing other laboratory equipment and a person in the distance. The text is overlaid on the left side of the image.

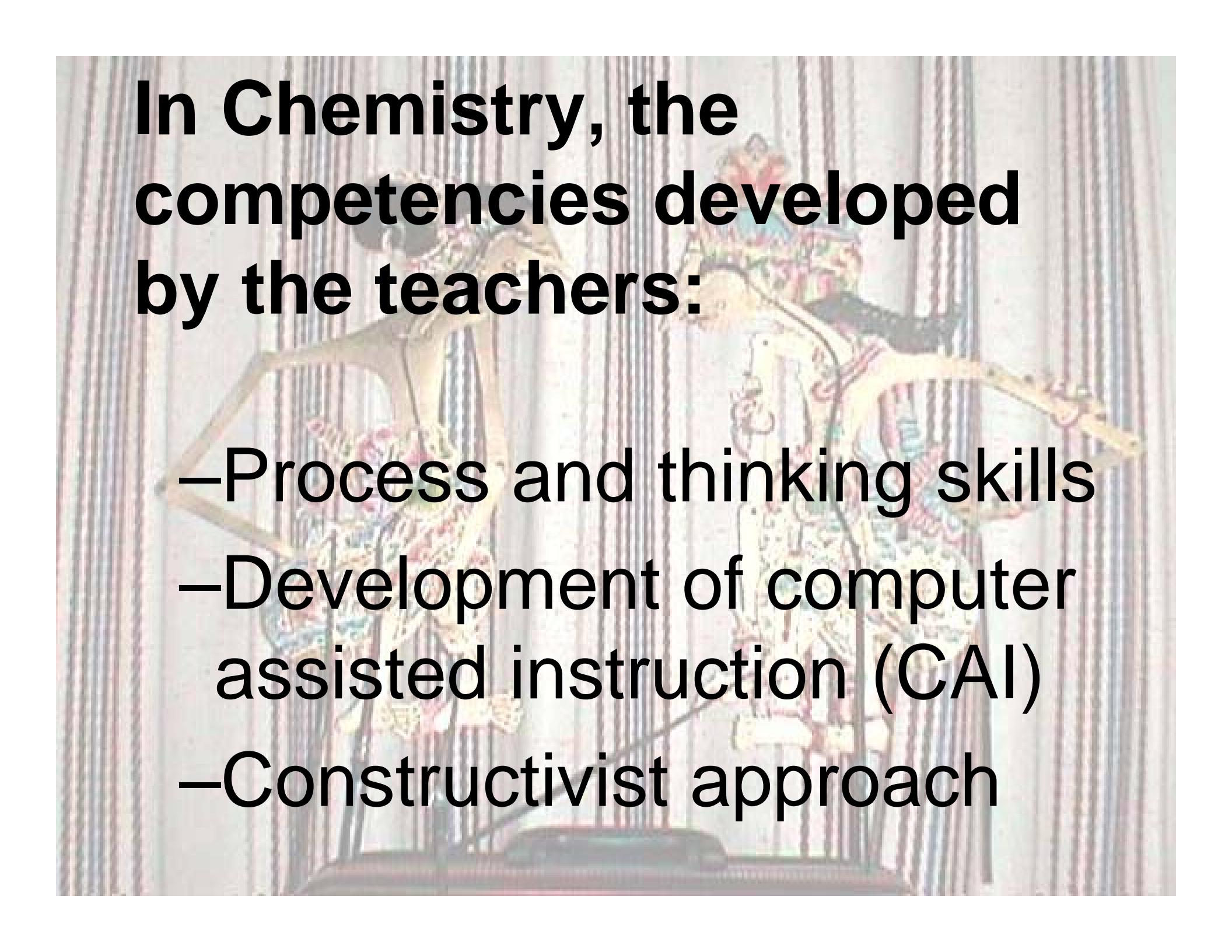
In Physics, the competencies developed by the teachers :

- **Multidimensional approaches,**
- **Students' worksheet for experimental methods**
- **Constructivist approach.**



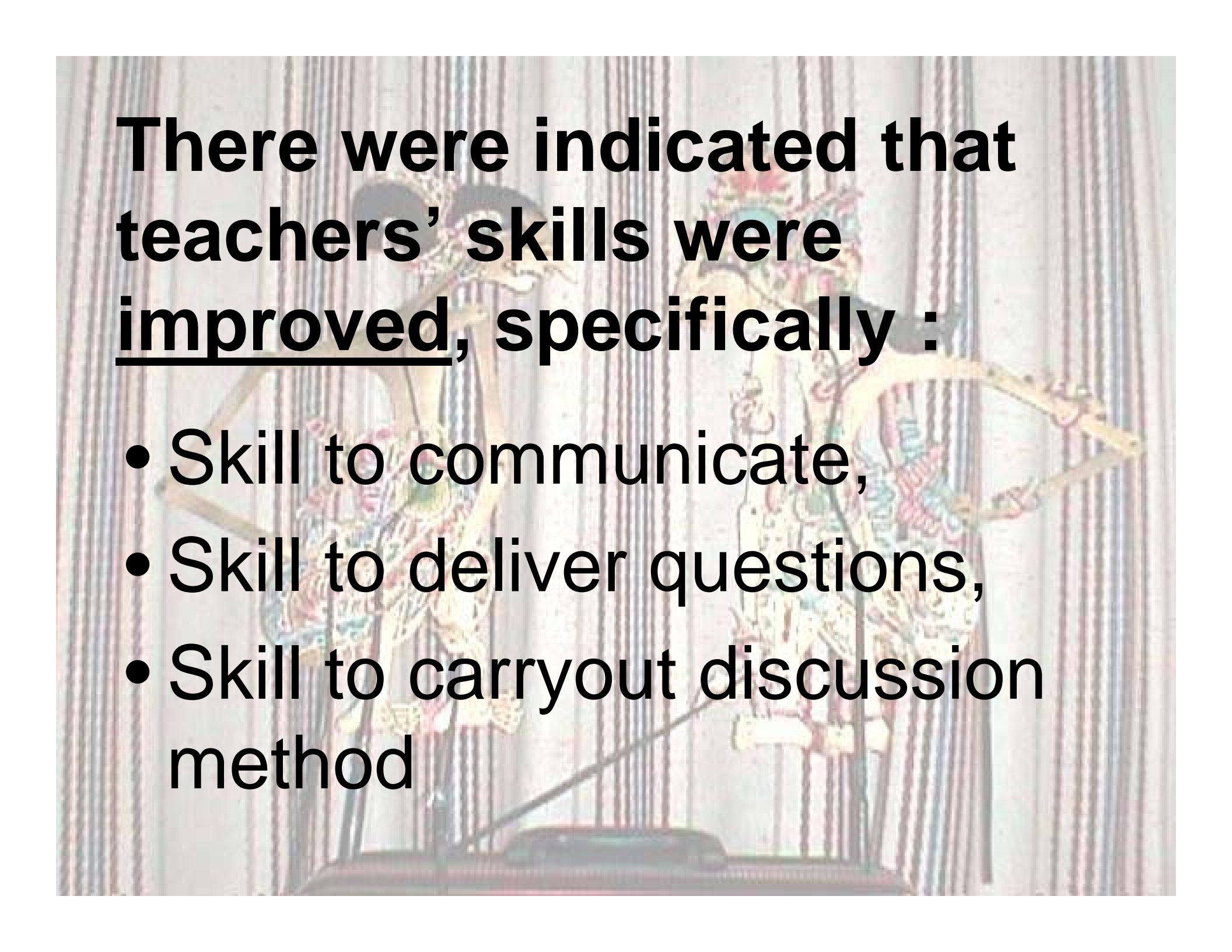
In Biology, the competencies developed by the teachers :

- **Process skills**
- **Students' worksheet for experimental methods**
- **Constructivist approach**



In Chemistry, the competencies developed by the teachers:

- Process and thinking skills
- Development of computer assisted instruction (CAI)
- Constructivist approach



There were indicated that teachers' skills were improved, specifically :

- Skill to communicate,
- Skill to deliver questions,
- Skill to carryout discussion method

Method of Exchange Experiences (Dissemination)

- Seminars
- workshops
- Audiences.
- Participatory discussion
- Presentation and simulation.

Dissemination of the Results *(inviting Head-Teachers)*



Exchange Experience with Japanese Teachers (Video)



Exchange Experience with Japanese Teachers



Exchange Experiences

Dissemination of the results of Lesson Studies to other teachers, Head Teachers and Stake Holders through Seminar.



The background image shows two marionettes (Bunraku) in traditional Japanese attire performing on a stage. The marionettes are intricately detailed with colorful patterns and are suspended by thin rods. The stage is set against a backdrop of vertical, light-colored curtains. The overall scene is a traditional Japanese puppet performance.

**Self-Initiation Workshop by
other Group of School
(Inviting Japan Experts)
(Video)**

RECOMMENDATIONS



- Teachers need to en-culture their efforts in innovating teaching learning processes
- Teachers need to re-define their role in teaching
- Teachers need to develop various methods of teaching

RECOMMENDATIONS

- Teachers need to develop supporting teaching materials
- Teachers need to develop alternative method of evaluation
- Teachers need to monitor the progress of their students' achievements

Prof. Shisumi Shimizu performed the Philosophy of Action how to serve the students

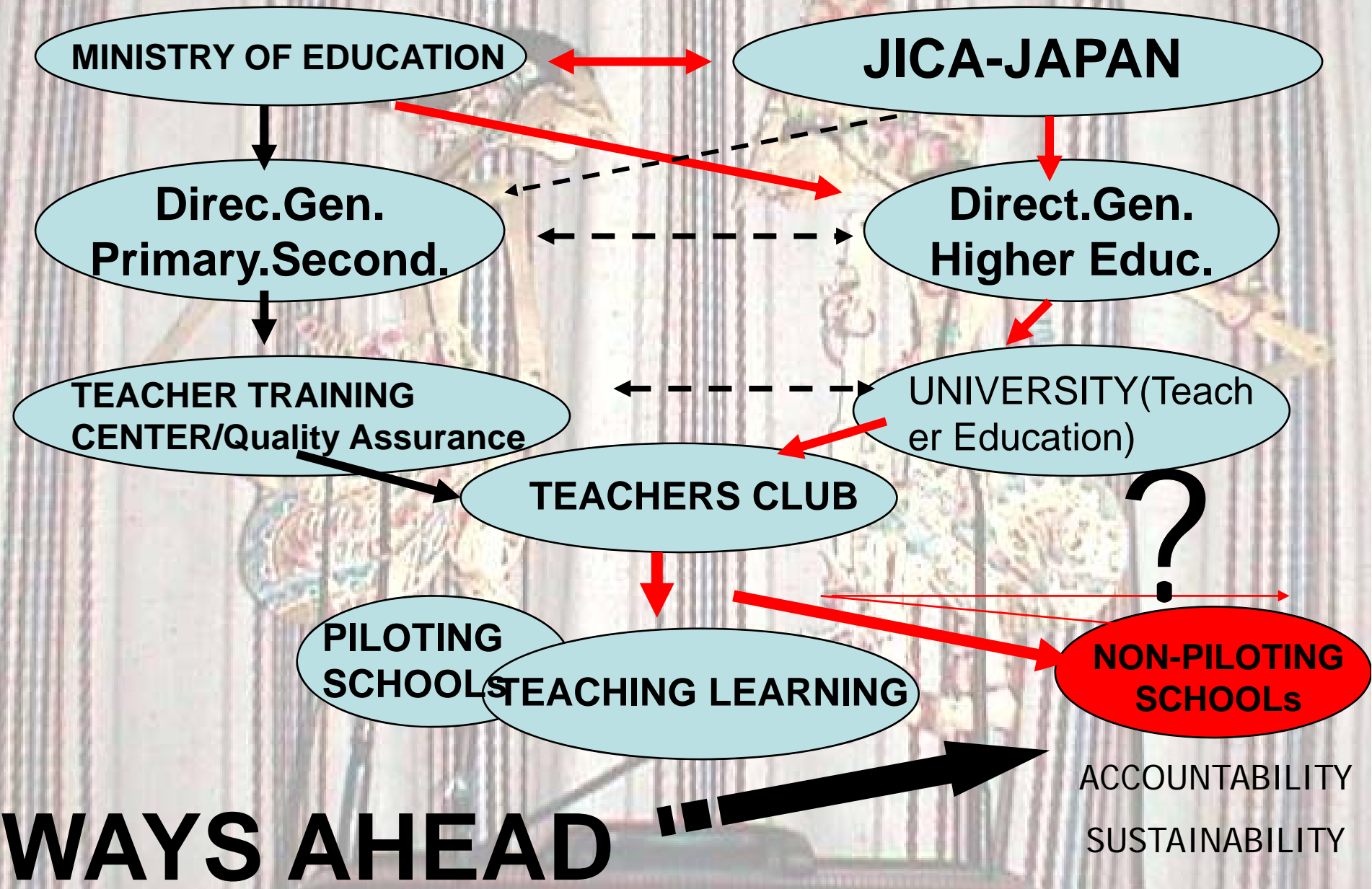
**Powerful Evidence
as reference for
teachers**



RECOMMENDATIONS

- Teachers need to participate in many kinds of seminars or workshops
- Teachers need to encourage their students to be active learners
- In curriculum: Teachers role need to be improved (from implementer → to developer)

COOPERATION AMONG VARIOUS EDUCATIONAL INSTITUTION IN INDONESIA



WAYS AHEAD

ACCOUNTABILITY
SUSTAINABILITY

WAYS AHEAD

IT NEEDS TO EMPOWER TEACHERS CLUB THROUGH INTERNATIONAL COOPERATIONS, COVERING:

– *PRELIMINARY RESEARCH*

– *LESSON STUDY*

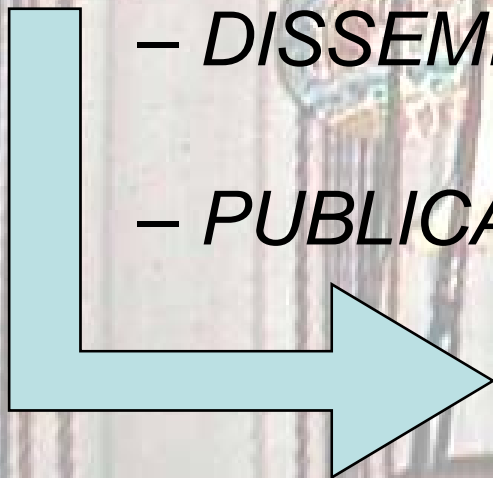
– *PILOTING*

– *DISSEMINATION*

– *PUBLICATION*



On Going
Research



NEW CURRICULUM

WAYS AHEAD

INPUT TO NATIONAL

EDUCATIONAL POLICIES

- **Develop simple and flexible national curriculum**
- **Support Teacher Professional Development**
- **Re-examine National System for Students Achievement Evaluation**
- **Re-examine National System in Procuring Students Text-Book**
- **Improve Teachers Wellfare**
- **Promote Collaboration among Educational Institutions including the role of Universities (Teacher Training Institution)**
- **Promote International Collaboration for Educational Development**