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JICA's International Cooperation in the Field of Mathematics Education

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- 1. JICA's Technical Cooperation in Mathematics Education
- 2. Achievements and Challenges
- 3. Sustainable Learning Improvement Mechanism (SLIM)



What is JICA?



• JICA is the executing agency of Japan's ODA.



Basic Principle of JICA's Technical Cooperation (TC)

- Capacity Development (CD) is a basic principle of JICA's Technical Cooperation (TC).
- CD is defined as "the process by which **individuals**, **organizations**, **institutions**, **and societies** develop "abilities" (individually and collectively) to perform functions, solve problems, and set and achieve objectives. (by UNDP)
- CD is an endogenous process in which partner countries take the lead.

- JICA's TC aims to develop a system / mechanism that is sustainable.





Global Trends of Educational Development and JICA's Basic Education Cooperation

| | <u>Global Trend</u> | JICA's Basic Education Cooperation |
|------|---|---|
| 1960 | | 1966 Japan Overseas Cooperation Volunteers (JOCVs) |
| 1970 | | |
| 1980 | | |
| 1990 | World Conference on Education for All (EFA) | 1990s Primary School construction 1994 Math and Science/Teacher Training |
| 2000 | MDGs Dakar Framework for Action | 2000 Lesson Study |
| 2010 | Learning crisis | 2010s Curriculum, Textbook and Assessment |
| 2020 | 2015 SDGs | Focus on "learning" |
| | 4 | |



JICA's TC Projects in Basic Education

JICA's Technical Cooperation Projects by Region (%) (126 Projects in 1994-2015)





JICA's TC Projects in Basic Education

JICA's Technical Cooperation Projects by Sub-sector (%) (126 Projects in 1994-2015)





Major Approaches of JICA's TC Projects in Math and Science Education

1. Teacher training approach

To develop skills of teachers <u>to deliver</u>
 <u>learner-centered lessons</u> that motivate
 students to think and find solutions.
 To establish <u>a teacher training system</u>.
 (cascading model)

* Lesson Study was introduced in some countries for continuous school or cluster-based training



Strengthening of Mathematics and Science Education Project in Kenya



Lesson Study Project in Zambia

2. Learning materials development

approach (by Japanese volunteers)

Girls studying with textbook in Guatemala





Example: INSET System Established at Secondary Level in Kenya





Major Achievements of JICA-supported Math Education Projects

- 1. Established a sustainable in-service training system.
- 2. Improved lesson delivery.
- 3. Improved student's participation in lessons.





Major Challenges Encountered by JICA-supported Math Projects

- 1. The learner-centered teaching method does not necessarily lead to improvement in children's learning.
- 2. The learner-centered teaching method is implemented in the classroom only to a limited extent.







1. The learner-centered teaching method does not necessarily lead to improvement in children's learning.

| Cause | Deeper Cause |
|---|--|
| (a) Activities in the lessons do not promote learner's thinking. | Activities are incorporated for the sake of activity; e.g., group work. Teachers themselves do not understand the purpose of each activity in the lesson. |
| (b) Teacher's attention to learner's thinking and learning is not sufficient. | Many teachers have a tendency to think that what matters is what teachers do, not what learners do. Many teachers do not observe learner's behaviours carefully. It is difficult for many teachers to understand the status of learning of their learners because learning is not visible. |
| (c) Many learners do not sufficiently master basic knowledge and skills. | Sufficient time and opportunities were not given to learners to consolidate and retain their understanding. Lessons were focused on procedures, not conceptual understanding. |



2. The learner-centered teaching method is implemented in the classroom only to a limited extent.

| Cause | Deeper Cause |
|--|---|
| (d) There are too much content in the curriculum (syllabus). | When developing curricula, time necessary for learners to think and discuss are not considered. In some countries, a curriculum development process does not include practitioners such as teachers. |
| (e) There are few items that assess higher-order thinking skills in high-stake tests. | In some cases, the achieved curriculum (assessment) is not aligned with the intended curriculum. |
| (f) It is difficult for many teachers to apply the learner-centered teaching method learned in the training to other lessons. | Improving a lesson requires "kyozai-kenkyu", namely, an intensive study of teaching and learning content. It is not easy for a teacher to improve lessons by her/himself. |



Thee main factors of SLIM





(a) Increase in Engaged Time on Learning





Individual learning



Mutual learning



(b) Textbook and Teacher's Guide



1.Content of textbooks2.Structure of textbooks3.Importance of try-out4.Spport for lesson delivery for teachers (Teacher's guides)





(c) Assessment-based Support for Learning

Teacher's mind-set should shift from "teaching" to "learning support"









Learner-centered lesson