

**Institute for Advanced Study/Park City Mathematics Institute
International Seminar: Bridging Policy and Practice
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**Establishing Regional PCMI Seminars:
Uganda as an Example**

Background Information

The Park City Mathematics Institute (PCMI) brings together mathematicians, undergraduates, mathematics researchers, and secondary school mathematics teachers to work on mathematics at their respective levels as well as foster vertical interaction among the groups. The Secondary School Teachers Program, one component of PCMI, intended that a “team” of representatives from secondary schools from different locations in the country along with faculty from a related university would work together outside PCMI to enrich mathematical content knowledge.

An outgrowth of PCMI is to consider supporting smaller PCMI-type regional events in other countries as a first step to a larger event in subsequent years. The following details considerations that should be addressed in creating a PCMI regional event using Uganda as a model site in central Africa.

Lessons Learned from Early PCMI Experiences

Careful planning and consideration must be given to cross program components to effectively bring together conference participants. Each constituency of the conference must feel they will benefit from attending the conference.

Goals for “PCMI Uganda”

- Inspire and collaborate to improve practices related to teaching, learning and doing mathematics.
- Provide an opportunity for mathematicians to come together.
- Provide advanced mathematical content to graduate and secondary school teachers. (Selected undergraduates with interest in teaching would also be included.)
- Provide interaction with research.
- Give priority to secondary school teachers; in particular provide opportunities for them to enrich their content knowledge.
- Develop a stable linkage between universities and secondary school teachers.
- Include a cross program component in the institute. That is, a component of the institute should be dedicated to bringing together all participants.
- Create sustained networks and outreach programs for all involved in mathematics education.

Expected Outcomes

- Increased cooperation between secondary school teachers, university faculty, and mathematicians to enhance the mathematical content knowledge of teachers and help universities understand teaching.

- An emphasis by mathematics lecturers on both pedagogy and content.
- Improved curriculum that is relevant to Uganda's educational system.
- A forum for the international community to become more aware of Uganda's educational needs in terms of equipment (i.e., books, technology, etc.). Participants in the international seminar may be able to provide ideas on how Uganda may be able to meet these needs.
- Enhanced ability of secondary school teachers to better inform their students about prospective careers in mathematics and also the applications of mathematics.
- Increased international connections in terms of research, publications, and the presentation of the research work in Uganda (international seminar).

Planning for Conference

Groundwork to be done in Uganda:

1. Establish timeline, secure funding, and make local arrangements
2. Forge a shared purpose to ensure vested interest by all involved
3. Planners should attend PCMI to gather information about designing and running the institute.
4. Primary planners will develop an overall timeline by December two years prior to the event.
5. Develop work plan (including detailed timeline).
 - a. Responsible agents
 - i. Local organizing committee
 1. Handles finances, facilities, technology support, venue, local transportation, visa issues, participant registration, etc (logistics).
 - ii. Scientific program committee
 1. Choose committee members to represent each part of program
 2. Determine specific details of programs including outcomes
 3. Determine speakers/participants

Sustaining Momentum

1. Develop and sustain national, regional, and international networks
2. What are possible mechanisms to create outreach groups (example: mathematician who works with local teachers around professional development throughout year)
3. Work through local organizations to provide continued support. May include international networking
4. What are some possible funding avenues (national, regional, international)?
5. Who may be invited to visit/participate as potential funding sources?
6. Provide ongoing professional development
7. How will support be provided to teachers in rural/isolated areas?
8. Disseminate products of institute.
9. Develop evaluation plan for institute.
10. Should feedback be sought at the end of each day? Definitely at the end of the conference.
11. How can feedback be collected from attendees after the conference to measure long-term impact?

Considerations

1. Uganda attendees at PCMI have gathered ideas about the features of PCMI that may work in an Uganda PCMI.
2. Organizers of this event must be carefully chosen to
 - a. be representative of conference programs,
 - b. have the ability to facilitate,
 - c. bring together people with a common vision.
3. Assistance from people outside Uganda may be needed to help in planning/organization.
4. Look for involvement of other relevant and established groups such as FAWE.
5. Define clear roles for mathematicians.
6. Involve the Minister of Education Secondary level at the earliest possible stage.
7. Offer a component for graduates, a component for teachers, and a component for both together.
8. Build upon events/organization(s) that currently exist:
 - a. Two large universities within the city
 - i. Makerere University and Kyambogo University
Mathematics lecturers, mathematics educators, mathematics researchers
 - b. Uganda Mathematical Society. They are involved in the mathematics for all of Uganda.
 - i. Involves lecturers and secondary school teachers, is embraced by the Ministry of Education and all the head teachers and heads of departments of mathematics, and runs Mathematics Contests every year throughout the country beginning with primary level and extending to tertiary level.
 - c. Ministry of Education
 - i. Necessary to gain support for the initiative
9. Mathematical focus to consider for institute
 - a. Look at mathematics as a connection to diseases and public health, social content science, medical field, local government, HIV, social aspect of mathematics and its relation to mathematics. The Institute needs to build a connection that sends a clear message to the public yet connects to the goal of the institute. People are needed who can help connect this type of content to teaching. A program design must have components for undergraduates and teachers but at the same time send the message that these people have a mathematical expertise that will help the general public. Technology will play a critical role and should be involved at both the conference and follow up. Paper and pencil will not be sufficient. Possible themes might be an area where there is expertise in the country or region, for example epidemiology, mathematical modeling with an emphasis on health issues. This could include malaria.
10. Regional/local planners should consider how to tap into the expertise of the PCMI International Seminar participants.