

Training malaria modelers from sub-Saharan Africa: Experiences from the faculty enrichment (FE) program in the United States and Africa

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Faculty Enrichment Program

- An 18-week intensive in-person training program
 - Sub-Saharan African mathematical modeling faculty
- Train a critical mass of modeling scientists who are:
 - Training the next generation of modelers
 - Retained within Sub-Saharan Africa
 - Working closely with local malaria control programs to provide operational support
 - Competitive in obtaining grants from international funding agencies
 - Closely networked with each other across Africa and with international partner

Objectives of the faculty enrichment program

- **Learn applied malaria modeling**
 - Science and thinking:
 - lectures
 - journal clubs
 - development of focal project
 - Agent-based modeling:
 - technical implementation of the focal project with EMOD
- **Improve written and oral scientific communication**
 - Aims page on focal project
 - Biosketch
 - 4 presentations
- **Build connections**

Three successful FE trainings

- 2 years in the US Northwestern University (NU)
 - 4 participants in year 1
 - 4 participants in year 2 (two instructors from previous FE)



- 1-year session in Africa (Ghana and Senegal)
 - 5 participants for the English site
 - 5 participants for the French site



Ghana team

- Target Population
 - Faculty and PhD candidates with interest in Applied modeling

Program Staff

Founding Director



Jaline Gerardin

Ghana Program Directors



**Isaiah
Agorinya**



**Benedicta
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Senegal Directors



Mor Absa Loum



Ousmane Diallo

Instructors



**Abdulzeid Yen
Anafo**



Justice Ahetor



**Aboudou Karime
Tabibo**



Oumar Billa

Program Evaluation



**Emmanuel
Manu**

Program structure

Program at a glance

Program Phases

Week 0 – Align on basics

Weeks 1 to 5 – Gaining familiarity with EMOD and applied modeling

Weeks 6 to 10 – Developing your focal project

Weeks 11 to 14 – Advanced EMOD; continue on focal project

Weeks 15 to 18 – Completing the focal project; post-program planning

Program Components

General	Individual Project
Example Exercises	Specific Aims Page NIH-Style Biosketch Presentations
Lectures Tutorials Roundtable Discussions Journal Clubs	Peer Editing Hour 1-on-1 Meetings

Technical component: Lectures & Tutorials

- **Lectures** are presentations from instructional staff covering background information. Advanced topics later in the program are generally taught this way.
 - Goals: convey background information or theory
 - Expectations: attend, pay attention, ask questions
- **Tutorials** are interactive walkthroughs of EMOD or EMOD-handling code.
 - Goals: explain how to use EMOD at a basic level, so that participants have some tools they can use to figure things out
 - Expectations: attempt exercises beforehand, attend, pay attention, ask questions

Communication and scientific development component

1. Preparing a Specific Aims page

- page is a 1-page grant proposal on a focal project.
- help participants think through their project and why they want to do it.

2. Oral presentations

- 4 presentations, with feedback sessions with the team and other participants.
- improve slide decks, presentation skills, and practice giving constructive feedback to others

3. Biosketch

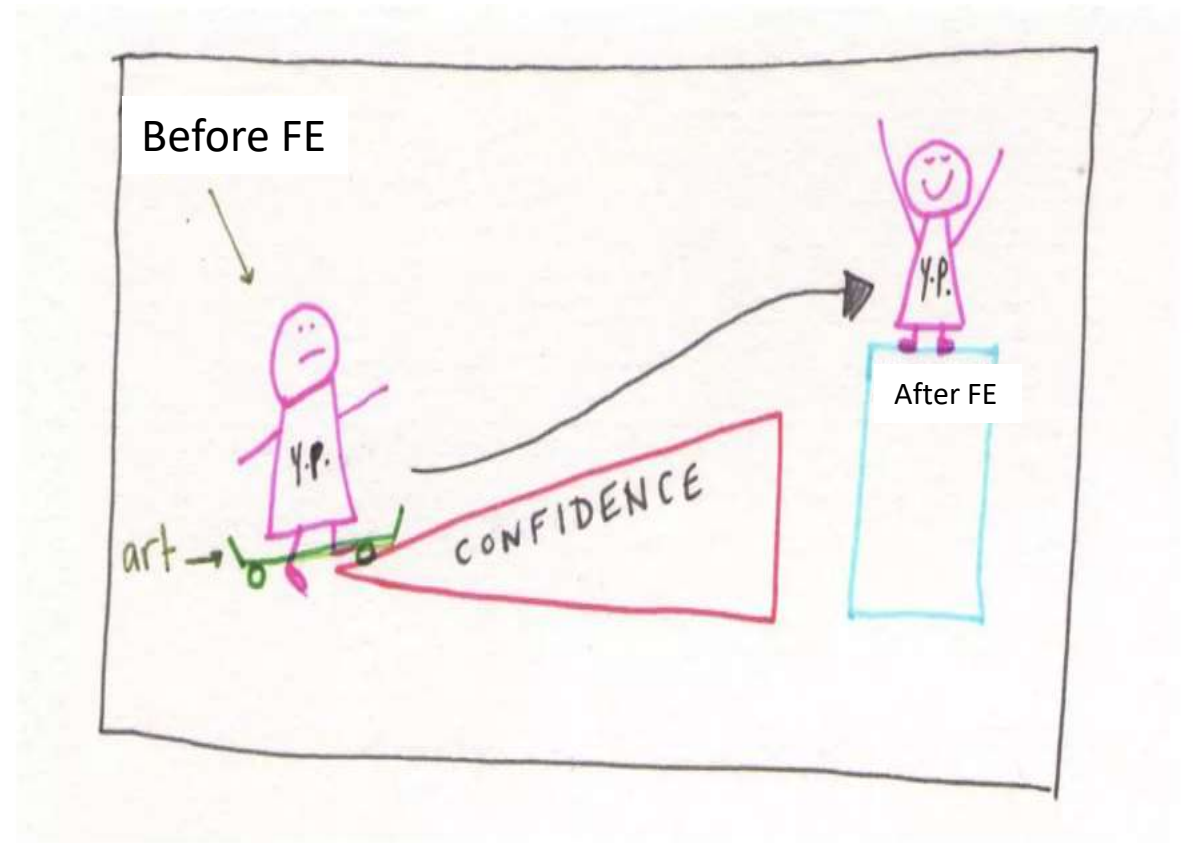
- NIH Biosketch to highlight certain CV items and your contributions to science.
- a good document to use for future grant applications.

4. Journal Clubs

- Demonstrate example applied modeling projects with EMOD
- Learn about the applied modeling field and other major models
- Learn how to critically read an applied modeling paper

Training Outcomes

- Outcomes:
 - Project work presentations
 - Specific Aims and Biosketch
 - Presentation skills and scientific communication
 - Networking



Impact of program

- Appreciation for the program and take-homes

“I have learned a lot from this program, Not just the technical aspect but also the non-technical side. As a faculty at a University, I will take back what I have learned by asking modeling questions, group meetings providing critiques on presentations, developing a sketch and an aims page, and back to my group”

- Greater appreciation for the duration of the program
 - Non-technical components were perceived much more positively at the endline as participants made better connections between technical and non-technical components

“Now, for me, the most fundamental thing here is the fostering of critical thinking. How can I put it, by reading articles that are already edited by other people, by taking part in sessions where you try to review the work others are currently working on. You get the idea. This seems very important to me and I think it sharpened my critical thinking skills.”

~Facilitator and previous FE participant

Program Evaluation

Baseline

- High expectations for mastering applied modeling and EMOD, but initial feedback overlooked scientific communication.

Midline

- Participants struggled with diverse backgrounds, EMOD parameters, and program intensity. Valued team meetings, and journal clubs.

Endline

- Appreciation for program structure, with a desire for deeper theoretical content and better guidance on EMOD, sense of fulfillment

Lessons Learned at both US and Africa Setting

USA Site	Africa
Exposure to a diverse set of experts and a well-established infrastructure for advanced research	Cultural familiarity including language for French speakers
Time away with no distractions	Reduced visa challenges
High computing and good internet connection	Cost-effectiveness alongside the technical and collaborative benefits
	Train other non-FE participants

A handwritten signature or set of initials in black ink, appearing to be 'PRL' with a large flourish underneath.

Challenges of FE in both US and Africa Setting

USA	Africa
Coordinating international travel (Visa challenges)	Access to computing resources
Accommodating diverse time zones	Poor internet connectivity
Extended stays far from family	Work Interruptions due to proximity



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NU Team



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Stahlfeld**



Ben Toh



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Ouedraogo-
Ametchie**

Guest Speakers

1. Melissa Penny (The Kids Research Institute)
2. Andrew Shattock (The Kids)
3. Pete Winskill (Imperial College, London)
4. Prashanth Selvaraj (IDM)
5. Yaw Afrane (University of Ghana)

Ghanaian Team



Thank you!!!

Contact us: fehana24@gmail.com