“Science Education in Northern Uganda”

GuluNap-Science

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Gulu - Uganda
Collaboration in Science Education

Teacher-to-be = BSE (Biol, Chem, Phys, Math)

- Re-design of Curricula and Lab-work
- Preparation of Gulu University Young Staff
- Proposals/Materials (Science Education Research)

In-service Teachers (Physics, Secondary Schools)

- Re-construction of Knowledge
- Team Work
- Low-cost Experiments (easy-to-disseminate)
- Notes (lack/scarcity of Textbooks)
- Personalised Suggestions
Gulu: Bachelor in Science Education

Scarce Power, NO Public Transport
NO (or Old) Textbooks, Very Scarce ITC
Few Teachers (often from outside)
Inadequate or No Labs, Very Guided Approach
Few (or None) Questions by Students
Often Mnemonic Learning (from Notes)
Very Few Women
Costly University Fees
National Exam for Government Support
Great Formality (ex Britannic Empire)
GULUNAP-SCIENCE  2006 → NOW

BSE (I, II, III year)  NEW COURSES
Basic Physics Education, General Astronomy, Introductory General Physics

• Sinergic Mix: Lecture/Lab/Question-Time
  • Co-presence of 2 professors
  • Conceptual Nodes
• Lab-work: low-cost, local materials
• Proposals from Physics Educ. Research
  • Activities’ Notes
• Experiments’ Worksheets
• Problems, Portfolios

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BIOLOGY  2006 ➔
Animal Histology and Physiology
Ecology

CHEMISTRY  2008 ➔
Organic Chemistry I

MATHEMATICS  2009 ➔
Differential Equations II
In-service Physics Teachers NUTS1 (11-16 Dic. 2006)

Internally Displaced People → Internally Displaced Schools

Secondary Schools: often No Resources
Teachers: often Not Prepared

First Workshop in Northern Uganda
• 32 Teachers (17 Schools)
Previous Teaching: 6800 IDP Studs
• Team- Work, Experiential
• Knowledge Re-Construction
• Lab: Local, No-cost Resources
• Apparatuses: Easily Reproducible
• Portfolio
• Notes as Textbooks

FAO 25/11/11
NUTS 1 Example LAB-WORK: Telemeters

Measuring Distance via Angles

Drawing the quadrant

More “Expensive” Components: Clasps

No-Cost Pendula: Fruits + Fibres
In-service Physics Teachers NUTS2 (17-22 Gen. 2010)  
“LIGHT IN NORTHERN UGANDA”

- 35 Teachers (19 Schools) (75%)
- Previous Teaching: 3500 IDP Studs
- Team-Work, Full Immersion
- Re-building of Optics Knowledge
  + some XX century Physics
- Lab-work (also low-cost)
NUTS 2 2010  
Participants’ Characteristics

SECondary School Education  
(13 years, including Primary)  
Secondary School “A” Level (7)  
Diploma in Secondary Education (14)

University Degree  
Bachelor in Science Education (3 years) (13)  
BSE + Postgraduate Diploma in Secondary Education (1)

19 Schools from 5 Northern Uganda Districts  
ADJUMANI (4) - GULU (4)  
KITGUM (4) - LIRA (4) - PADER (3)
OPTICS Experiments: Interference, Polarization

Most Expensive Material:
   a Cheap Laser Pointer
NEXT FUTURE (2012 →)

More NUTS for in-service Teachers
(PHYSICS, MATH, BIO, CHEM)

Basic Science for Agriculture

Post-harvest Technology of Fruits