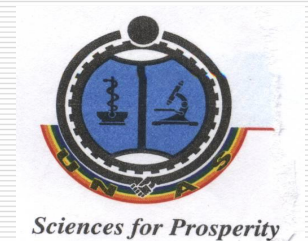




Higher Education Institutions in Uganda: Challenges in the Teaching and Learning of Sciences

PRE-CHOGM SYMPOSIUM ON S & T
Mbarara Univ. S & T

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Background

- Developed countries invest more in ST & I
 - Others continue to lag behind
 - Investments in ST & I reflects a nations strength in development
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Three Categories

- Strong ST & I capacity
 - 25 countries, e.g., US, UK, Japan
 - Enjoy across-the-board strength in all areas of S & T
 - Have capacity to transfer scientific and technological knowledge into products and services that boosts their economies
 - Are rich in ST & I innovations
 - Are also financially well-off
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□ Moderate S T & I capacity

- 100 countries, e.g., China, India, Brazil, Malaysia
 - Diverse group with wide ranging capabilities
 - Have a degree of competence in a select number of fields but broad pockets of weakness remain
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- Third category countries with weak ST & I capacity
 - 79 countries majority are in sub-Saharan Africa, e.g., Uganda, Kenya, Nigeria, etc.
 - Limited capacity in every field of science
 - Poor teaching facilities and substandard laboratories
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- Poor scientific infrastructure (classrooms, laboratories)
 - Ability to bring scientific knowledge and technological know-how to the marketplace is weak
 - Scanty ability to transfer knowledge into services and products
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Challenge

- The above scenarios call for action
 - and the challenge is how to improve ST & I particularly in the scientifically moderate nations and the 79 with weak ST & I to reach the levels of the 25
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National Level



- Government has pronounced policy to enhance support for science education
 - All human communities are capable of creating ST&I they require for development in a process I term “scientisation” similar to “mathematisation”
 - Science education mandatory at Secondary school level
 - Engage in capacity building (teacher training, laboratory facilities) to facilitate learning and teaching of sciences with ST &I
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Challenges

- GoU has resolutely promoted UPE
 - However, emphasis on UPE has lead to limited focus on secondary and tertiary education in developing especially scientific skills
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Challenges....

- Uganda's secondary schools & Universities are characterized by:
 - Lack a critical mass of high caliber skilled personnel
 - Have inadequate teaching facilities (Laboratories and equipment)
 - Shortage of candidates pursuing science careers
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Inquiry based science education (IBS)

- IBSE is being widely advocated for by science educators across the world

Using IBSE methods, students develop concepts that enable them to understand the scientific aspects of the world around them through their own thinking using critical and logical reasoning about evidence that they have gathered

This breeds practical scientists and encourages innovativeness

Characteristics of IBSE

- First hand manipulation of objects and materials and observation of events
 - Using evidence from a range of other sources of information including textbooks, teachers or scientists
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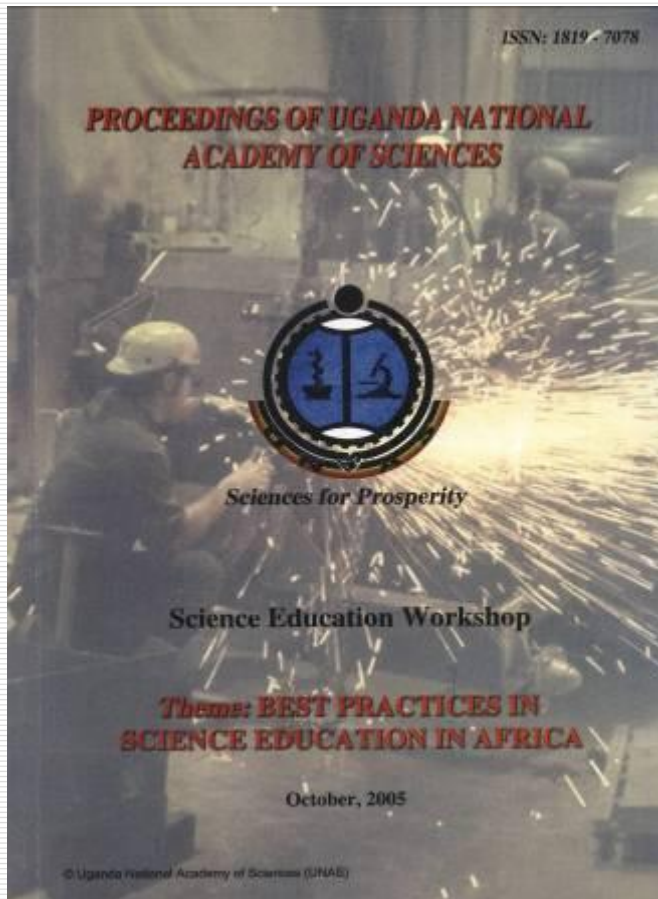
Characteristics of IBSE

- Raising questions for investigation, making predictions, planning and conducting investigations, solving problems, testing ideas, reflecting on new evidence and developing new hypotheses
 - Students collaborating with others, sharing their ideas, plans and conclusions; advancing their own understanding through dialogue with others
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Characteristics of IBSE

- Using IBSE teachers lead students to develop the skills of inquiry and the understanding of science concepts through the students' own activity and reasoning
 - This involves facilitating group work as well as providing for direct exploration of and experimentation with materials and access to information sources
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Promote best practices in the teaching and learning of sciences



Best Practice recommendations

- Inquiry based methods
- Rich menu of practical work using local examples
- Emphases relevance of content to learners
- Regional centres of excellence
- Mobile laboratory facilities
- Align curriculum to community/society needs

Recommendations

- ❑ Conduct research on best practices in teaching and learning of sciences
 - ❑ Conduct regular meetings to review best practices in teaching and learning of sciences using case studies
 - ❑ Periodic review of curricula
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Recommendations.....

- ❑ Establish and promote mechanisms to ensure quality assurance in science education
 - ❑ Build capacity to enhance best practices in teaching and learning of sciences at all levels
 - ❑ Lobby governments to formulate favourable policies
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THANK YOU
