Food Production and Security: Innovation in Higher Education, Its Delivery Modalities and Strategies

Purpose: Information
Submitted by: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Food Production and Security: Innovation in Higher Education, its Delivery Modalities and Strategies

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Background

“The world now has the largest generation of young people in history. I place great hope in their power to shape our future”

United Nations Secretary-General Ban Ki-moon

Harnessing the young population

- Total world population in 2011; of this 1.8 billion is young group (UNFPA, 2014)
  - The youth as shapers & leaders of our global future
  - Regarded as the huge potential for economic growth
- Higher education is no longer a luxury; it is essential to national social and economic development
- Higher education drives the competitiveness and employment generation
- Demand for education in developing economies skyrocketed as education is still regarded as an important bridge/ingredient of economic and social development (ADB, 2011 & Amutabi and Oketch, 2003).
Mega challenges

852 million hungry people, mainly in developing economies

Below $1

Latin America & Caribbean, 53 M

Near East; North Africa, 39 M

India
221 M

Sub-Saharan Africa
204 M

Other Asia/Pacific
156 M

China
142 M

Research Goals: Ensure food security, reduce poverty, and protect the environment

Population explosion

Poverty

Water scarcity

Climate Change

Land degradation

Poverty

Current scenario and gaps of HE in developing economies

The quality of knowledge generated within higher education institutions, and its availability to the wider economy, is becoming increasingly critical to national competitiveness.

Four overarching challenges of HE (ADB Report, 2011):

1. Sustaining and improving education quality
   - Lacks well-designed academic programs and a clear mission
   - Faculty: under qualified, lack motivation, and poorly rewarded; Students: poorly taught & underdeveloped curricula
   - Inbreeding

2. Improving the relevance of curriculum and instruction at a time of rapid change in labor market needs
   - Imbalance across fields of study i.e. Mongolia, Cambodia and Vietnam are low in S & T, which is expected to lead innovation, job creation & economic development
   - Academe – industry link is still weak
Current scenario and gaps of HE in developing economies (Contd.)

3. Increasing and better utilizing the financial resources available to higher education
   - Rapid enrolment increases in some economies; Steep decline for some i.e. Sub Saharan Africa & South Asia
   - Absorbing larger and increasingly diverse learners
   - In India, allocation is 3.5% of GDP for education out of the 6% reserved (MHRD, 2007)

4. Balancing the continued expansion of access to higher education with greater attention to equity and to the need to raise quality
   - Use of technology-based distance education to deliver instruction; Looking for more flexible learning environment with learning outcomes as a key concern
   - Example: A national Open University was established in 1995 in the Philippines as a unit of the University of the Philippines
   - Gender equality
   - Addressing physical barriers (distance & safety to travel to & from Schools)

Why the need and strategies to address the gaps of higher education

The need to develop core qualities of higher education characterized by:

1. Sufficient autonomy, with governments providing clear supervision
   - Improve instructional quality thru enhanced capacity of staff
   - Campus-based professional development
   - Consolidation of smaller institutions to promote coherence and critical mass

2. Explicit stratification, allowing institutions to play their strengths and serve different needs
   - Concept of ‘Center of Excellence’
   - Entrepreneurship paradigm
   - Rationalizing and distribution of institutions and offerings
   - Utilizing advances in ICT to increase efficiency by linking remote universities to national universities; Projects that support cross-border collaboration aimed at facilitating regional centers of research excellence
Why the need and strategies to address the gaps of higher education

3. Cooperation as well as competition
- Creating i.e. “learning commons” where facilities—computers, libraries, and laboratories—are open to all students
- Importance of databases and repositories (not only national but also regional) for improving administration & governance and in support to the move toward greater autonomy
- Structural changes with inter institutional cooperation

4. Increased openness, encouraging higher education institutions to develop knowledge-(and revenue-) sharing links with business and to deepen the dialogue with society that will lead to stronger democracy and more resilient nations
- Harnessing public-private-partnerships
- Crafting policy for some and strengthening implementation of policies for HE to be more inclusive
- Supporting ICT as a strategy for expanding access; Strengthening financial assistance programs
- Developing funding models i.e. cost sharing between universities & students and their families

ICT-mediation as an emerging pedagogy

- Dramatic change in technology landscape for the last 15 years
- Innovative use of Information and Communication Technology (ICT) can potentially solve gaps in higher education.

**Informative tool**
Provides vast amount of data in various formats such as audio, video, and documents

**Situating tool**
Creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible

*Examples: AgED Open CourseWare & MOOCs
Course in Horticulture
AERVLES- Developed by Dr Antonio Refre of VSU

**Constructive tool**
Constructs data and generates analysis

(Ashish Hattangdi and Atanu Ghosh, 2007)
ICT-mediation as an emerging pedagogy (Contd..)

Communicative tool

It can be used to remove communication barriers such as that of space and time (Lim and Chai, 2004).

Voice

Instructional audio tools that include interactive technologies

Video

Instructional video tools that include still images, prerecorded moving images, and real-time moving images combined with audio conferencing.

Print

Instructional print formats that include textbooks, study guides, workbooks and case studies.

The revolution of world wide web (www)

Web 1.0

- The age of one and only language i.e. HTML
- Depend on advertising
- Nothing to exchange. Everything was about one way.
- Allows searching for information and simply reading it
- No flow or absence of communication between consumer and the producer of the information

Web 2.0

- The field of XML & other HLL
- Popularized by word of mouth
- Allows exchange of thoughts with other; ease in conversation
- Ability to contribute content and interact with other web users
- Allows to publish own content through few basic steps

Web 3.0

- Logical progression from the term Web 2.0
- Semantic Interface
- Ability to make connections and infer meaning
- Creates changes in how websites are created and how people interact with them
- Focuses on the concept of enhancing the 'intelligence' of the underlying architecture of the Internet
Proven web 3.0 platforms by ICRISAT-KSI

**AgED Open Courseware**

- An Open Source Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE).
- Initiates open distance learning (ODL) paradigm where research results become the building blocks for a flexible curriculum and learning experience.

**Website:** www.aged.icrisat.org

**Impact**

- **Students - 8865**
- **Courses - 19**
- **economies: 180+**

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**Krishi Gyan Sagar (KGS) and Krishi Vani : The Green Phablet powered by the Green Sim**

- Links research-extension-farmers-markets through innovative ICT mediated extension systems and public private partnerships for improving productivity and profitability
- Green Sim enables mobile information system for disseminating right information at the right time through public–private partnerships.
  - 35 free voice messages per week per farmer
  - Voice messages in 16 categories in multiple languages
  - Pilot project started in June 2013 and covers 15000 farmers
- With farm to fork approach addressing info needs of entire value chain
- Modules in both tablet/mobile app as well as web app
- Experimentation in progress in three experimental hubs including Bhoochetana districts
- Each experimental hub is unique and experiments are carried out with different set of partners to test the hypothesis.
Impacts of GreenPhablet

- Benefited more than 40,000 smallholder farmers in 171 villages in a span of six months
- Contributed to bringing forward info-entrepreneurs as new professionals to strengthen the existing agricultural extension system
- Provided opportunity to rural women/youth for added income as info-entrepreneurs
  - Example: 31,000 Indian Rupees earned by an info-entrepreneur in 15 working days
- Proven as financially sustainable ICT model anchored on public-private partnerships
- In Karnataka - the project increased agricultural productivity by 25-30 percent in Bhoochetana-covered districts
- A study by Digital Green, a partner organization on participatory video extension methods, concluded that this approach is 10 times more effective, per dollar spent in converting farmers to use better farming practices compared to classical agricultural extension approaches.
- Received the Flame Award 2013, instituted by the Rural Marketing Association of India (RMAI) for showcasing innovative use of technology of the decade

One Agriculture- One Science: A virtual academy for agriculture

Objective
A world in which all stakeholders can easily access and share the information, knowledge and skills they need — anywhere and anytime — in a cost effective manner

- Started as a virtual national academy for agriculture in India
- Enables agricultural stakeholders to have direct access to most knowledgeable technical experts
- Brought faculty from academia and research experts to develop research-infused curriculum
- ICT mediated dynamic virtual knowledge series platform
- Utilizes ICT mediated educational methods and approaches
- Contributes to institutional level capacities through knowledge repositories and pluralistic approaches
- Creates cadre of new ICT literate faculty, student, extension etc. professionals.
One Agriculture - One Science: A virtual academy for agriculture

Early Statistics from the first MOOC

Over 900 Learner participants enrolled for 8 weeks course

<table>
<thead>
<tr>
<th>YEAR OF BIRTH</th>
<th></th>
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</table>
| 1940-1950     | 40
| 1950-1960     | 60
| 1960-1970     | 80
| 1970-1980     | 100
| 1980-1990     | 120
| 1990-2000     | 140
| 2000-2010     | 160

Gender distribution

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<thead>
<tr>
<th>Gender</th>
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<tr>
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</tr>
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<td>Other</td>
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Conclusion

ICT as a means and an end in higher education

- Enhancing agricultural production
  - Relevant information at the right time; Early warning systems
- Improving market access
  - Up to date market information i.e. inputs and consumer trends for negotiating position
  - Decisions on crops and best place to sell and buy goods
- Building capacity and empowerment
  - Strengthening own capacities; Improving interaction and widening perspectives
- Providing access and exchange mechanisms in rural areas: connectivity and telecentres
  - Broadband internet access is central for societal innovation (storing large datasets and live communication; Telecenters in remote areas for global connection
- Creating multi-stakeholder mechanisms for learning
  - Linking rural communities with universities, research institutions, etc
  - Sharing of knowledge and lessons learned and support to policy processes
- Engaging and developing interactive course curriculum
- Entrepreneurship orientation
References

- Ashish Hattangdi and Prof. Atanu Ghosh. *Enhancing the quality and accessibility of higher education through the use of Information and Communication Technologies*.
- Jac Stienen, Wietse Bruinsma and Frans Neuman. *How ICT can make a difference in agricultural livelihoods*. International Institute for Communication and Development (IICD)

Thank You