Leveraging ICT tools to create a high-quality research and teaching environment

24 February 2019

1115 to 1230

The second part of the plenary session on Quality Education was on Leveraging ICT tools to create a high-quality research and teaching environment. Prof Abdoulie Jarra the PSC Member for Gambia chaired the session. The objective was to provide information to centres on how they can create teaching and research environments that are in line with international standards while leveraging ICT Tools.

Dr Dimitris Noukakis, the Director, MOOCs for Africa at Ecole Polytechnique Fédérale de Lausanne / Swiss Federal Institute of Technology Lausanne – (EPFL), made an inspiring presentation on the use of ICT in teaching, adopting new pedagogies, accessing online journals, using digital networking platforms; etc. He also reinforced the importance of reliable internet and power. He highlighted some challenges of digital connectivity in the context of African Higher Education institutions.

Dr Dimitris Noukakis' Key Messages

- EPFL – 11000 students, 2200 PhDs, 4100 staff, 1B Usd Budget. A science and Tech powerhouse in Europe
- The 4th Industrial Revolution has become a reality and it is characterised by big data, Internet of Things, Cloud, Machine learning. These are having a transformative effect on the industry and education in the next 10 years 50% of education will be delivered in a blended mode. 50% of education will be dedicated to project-based learning aimed at developing skills
- Campus infrastructure must be adapted to the technology era. At EPFL they don't build auditoriums. They provide small or group learning environments
- African universities were challenged to reflect on whether they were "building modern learning environments"? The times have changed - Early Universities were walk in libraries. Universities in developed countries have transformed the teaching and research environment by responding to the prevalent and ubiquitous access to digital tools and digital content
- When re-designing learning using online tools, faculty must remember that there is no single best media. The ICT tools to use always depends on the context – therefore the teachers must learn new skills and be able to develop a repertoire of online learning activities
- ACEs were encouraged to explore the Flipped Classroom[1] Methodology – students find information online. Then the classroom is about students presenting and the teacher guiding and validating with them.
- Dr Dimitris Noukakis shared information on the MOOCs4DEV project (https://moocs.epfl.ch/moocafrica-2/) featuring the experience from Yamoussoukro.
- There are 6 reasons for implementing blended learning: *Studies show students learn better (University of Iowa); It Promotes student autonomy and ownership of learning; It prepares students for a tech-centered world; It (can) cuts costs; It increases collaboration (student-*

[1] A flipped classroom is an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom. It moves activities, including those that may have traditionally been considered homework, into the classroom.

student, teacher-student, teacher-teacher); Keeps students more interested and engaged (as they use their everyday online media)

- The MOOCS (Massively Open Online Courses) and OER (Open Educational Resources) have potential to quicken development in Africa by improving the quality of education, enhancing the relevance of education, increasing the capacities of educational institutions, addressing the massification of education by enabling many learners to access quality materials, reducing inequalities between urban and underserved communities and supporting continuous professional development
- How African universities can harness the benefits of ICT in education?
    a. Rethink pedagogical methods and move towards active learning.
    b. Deal with technology issues - Use ICT, Learning Management Systems and learn how to design digital content
    c. Content – there is a great amount of relevant content online. Learn how to find it and localize it. Get the most relevant and quality content.
    d. Train the faculty members and teachers in pedagogy and the use of digital tools for educations
    e. Hire Qualified personnel to support pedagogical transformation
    f. Create the right learning environment – improve infrastructure and build quality classrooms
- The next generation of higher educational institutions are characterised by less brick and motor, continuous professional development and they reach out to underserved communities

Lessons from Ing Rev Dr Charles Anum Adams (Kwame Nkrumah University of Science & Technology)

- I flip the classroom to maintain the interest of the students.
- So, I go online to identify good content. Then I localize the materials to our context. My students value attending my classes because they know that they will get additional knowledge which they cannot find online
- I guide the students actively during class time. Most of the learning goes on outside the classroom.
- Can / Should you flip every class? Yes, but not all may be necessary. Emphasis must be on higher order thinking skills and application to complex problems. The flipped classroom cultivates students' engagements
- My Active Learning Strategies in my Flipped Classroom looks like this:
    - Brief question and answer sessions
    - Discussions integrated into the lecture
    - Impromptu writing assignments
    - Hands on activities
    - Experiential learning activities
- I confirm that EPFL are very experienced in designing online learning and harnessing ICT tools for quality education.
- The Flipped Classrooms can be applied to the STEM Programmes. For example - Lab processes and procedures, Demonstration videos, Design procedures; Construction and Industrial processes

Université Felix Houphouët-Boigny (UFHB, Côte d'Ivoire) Lessons implementing technology for education

- Institutional Commitment is very key for the successful implementation of innovative delivery methods and e-learning in a university
- Institutions must find a way to deal with change management – inspire your faculty, motivate them and tell them why
- Deal with the faculty work load issues
- We use MOOCs in doctoral training in the areas where we don't have the competencies
- I encourage all institutions to engage with the integration of technology – this will solve the challenges of massification of African Higher Education

QUESTIONS	**ANSWERS**
How are the hourly requirements in ICT-enabled education handled? What is the allowed number of credit hours?	Institutional commitment is very important. The institution must review the credit hours. Don't do it alone in your corner Student's study time is used - Students work in groups
How's is IPR regarding the course content handled? Some universities demand that courses belong to the universities.	100 MOOCs built at EPFL The intellectual work always belongs to the teacher But a MOOC is a collaborative product – IPR belongs to the collaborating teachers. We sign contracts and obtain rights for usage and broadcasting
Rapid change in technology: how are we coping and keeping up?	Continuing Education is key Enrol for MOOCs regularly Invest in upgrading your competencies
Are accreditation systems not based on the old systems of teaching? Are we sure that our accrediting systems are up to date?	Types of teaching methods are not outlined in the accreditation process. There are different delivery methods that are acceptable. Go beyond the national accreditation.
Assumption that there is access to internet – how do we reach women and underserved communities?	Virtual University of Senegal provides a laptop and 3GB modem. There are other good examples KNUST - Because of connectivity – we use offline video content. They save the content on flash drives, phones or laptops India provides offline versions of the content INP- HB : We have a data center – content is available on the intranet as long as students are logged onto the campus LAN. Don't worry students will always find access to internet
How do you circumvent the resistance to change?	I was against using technology The motivation is that if you are an expert – and you are recorded and watched by thousands, you will want to be part of it.

QUESTIONS	ANSWERS
Applicability of MOOCs? We are reconsidering some of these MOOCs. How do you assure practical skills training for engineers?	Online training on its own cannot deliver quality engineers. You need the labs. You need students to learn practical skills Virtual labs are good for learning how to manipulate equipment. But you still need the real practical exposure.
ACEI did not emphasize technology in teaching. Request that this is emphasized more	
Does EPFL have many anglophone partners? Seems to be mainly francophone partners.	KNUST is anglophone EPFL is small even though wealthy. We would like to scale up – but we are still exploring because we have limited capacity
Flipped classrooms and new educational methods does not mean you need MOOCS. You can still begin to use other innovative methods of teaching	
Infrastructure for online education? - How many people have used a textbook in the last week? - How many have looked at their phone in the last 30 minutes?	We use technology - clickers, laptops, smart phones We use a lot of group work spaces for students
How did Yamussoko manage to move forward? My institution is still a pilot.	At the highest level the Director General was highly committed. Else it was going to be very difficult.
Suggestion that an ACE focussed on Distance Education be set up	Maybe ACE for Digital Technologies?
Can a teacher hand over the teaching materials without going through the university?	Must go through their university. License agreement, distribution agreement and proper contract EPFL sell some of their MOOCs
Are MOOCS good?	They are the answer to the massification of education. They help to update the curricula

In the afternoon the participants split into thematic parallel discussions of the implementation plans.
The groups were:

a. Health
b. STEM
c. Environment
d. Education / Applied Social Science
e. Agriculture
f. Colleges of Engineering