Welcome to ACE Capacity Building Webinar Series

24th June 2020

First Webinar Title: *Use of e-Learning and digital resources in the COVID-19 era*

Anglophone Session

10 a.m. UTC (10 a.m. Ghana and The Gambia; 11 a.m. Nigeria)

Facilitator: Dr Dimitrios Noukakis

Moderator: Dr Graham Harrison
Profile

• Since January 2020, Dimitrios Noukakis has been in charge of Digital Education at the “Centre Excellence in Africa” at the EPFL. Between 2013 and 2019, he led the MOOCs for Africa program, a global initiative aimed at promoting innovative teaching methods in African universities, notably through the use of MOOCs. His current work focuses on digital technologies for education and their potential for transforming education at all levels.

• Between 2005 and 2012, he developed the strategy and marketing activities of EPFL’s graduate programs at the international level. Before joining EPFL, he worked as a publisher for Elsevier (1995-2000) and founded two marketing and communication companies for the scientific community (2000-2005).

• Dimitrios graduated in Chemistry (1986), holds a PhD from the University of Fribourg in Natural Sciences (1991) and an MBA from Business School Lausanne (2002).

Dr Dimitrios Noukakis,
Director Digital Education,
Center Excellence in Africa,
Swiss Federal Institute of Technology in Lausanne – EPFL,
Online Learning in the COVID-19 era

Dr Dimitrios NOUKAKIS
EPFL, Lausanne, Switzerland

Dr Abdourahmane MBENGUE
UVS, Dakar, Sénégal

24 June 2020
An opportunity to pause and reflect

- What exactly were we trying to achieve in the classroom and now outside of it?
  - Learning processes vs learning outcomes!
  - Transfer existing knowledge via distant learning?
  - Educate and prepare the young generation for tomorrow’s challenges?

Not only a fix to a temporary issue

- An opportunity to transform higher education for the benefit of All!
The WB-ACE taskforce’s proposal

In the context of COVID-19 and the closure of many universities (especially face-to-face lectures), WB and AAU are organising:

- Free access to MOOCs and Open Educational Resources (OER) available on global educational platforms: Coursera, edX, FUN, IBM

- Training for professors on how to integrate MOOCs and OER in their existing courses.

- Coaching for professors who wish to integrate MOOCs and OER in the different stages of their online pedagogical scenario (lesson plan).
Training content

4 modules presented as an online course on Moodle. It includes:

- 4 webinars on the use and integration of online educational resources in your courses.
- Resources: MOOCs / OER and resources related to instructional design online.
- Coaching: from July 20 onwards in online forums on the topics covered by the webinars.
Develop a common vocabulary on key concepts linked to online pedagogy and the integration of MOOCs and OER.

Review different types and modalities of digital education.

Identify the types and modalities best adapted to your courses.

Adapt the formulation of your learning objectives and pedagogical scenario to integrate MOOCs/OER into an existing course.
Overview of the presentation

- Different types of e-learning and their advantages and limitations
- Integration of MOOC and/or OER
- Key pedagogical elements of e-learning
- Example of a MOOC’s content and structure
- Next steps and calendar
- Questions
Different types of e-learning

E-learning: “e-Learning is the use of network technology to design, deliver, select, administer and extend learning” Elliott Masie, 1999

Different types of e-learning:

- **Synchronous** – learners and the instructor interact in real time, but from different locations.

- **Asynchronous** – self-paced online learning. If there is an instructor, s/he is not interacting in real time.

- **Blended learning** – combination of online and face-to-face learning.
Advantages and limitations of e-learning

Advantages

- Convenient and flexible
- Consistency and quality of learning
- Overview of participation and successful integration of key concepts
- Active learning, especially for learners who do not participate much in face-to-face classes (e.g. forum).

Limitations

- Dependent on (good) internet connection
- Not for every discipline
- Developing online courses takes time and resources
- Requires self-discipline, self-motivation and time management skills
Integration of a MOOC/OER

Different modalities of integration

From learning exclusively face-to-face to exclusively online, the OER can be used according to the following blended learning modalities:

Continuum of Technology Usage
From Fully Face-to-Face to Entirely Online

Integration of a MOOC/OER

Different levels of integration

- Total integration
- Partial integration

- Macro
- Meso
- Micro

MOOC
Modules
Sections
Activity
Flipped classroom

The reverse of traditional teaching practices: students are introduced to new content at home and practice in class.

F – FLEXIBLE ENVIRONMENT
L – LEARNING CULTURE
I – INTENTIONAL CONTENT
P – PROFESSIONAL EDUCATOR

Source: flippedlearning.org

The Flipped Classroom

Out of Class

Before Class

Students get acclimated with new concepts and terminology via digital media. Students may take notes and jot down questions for further discussion.

During Class

Students explore new concepts through learning activities, including peer discussions and 1:1 interactions with the teacher.

After Class

Students continue checking for understanding of the concept through higher order application and evaluation.

Source: Thyatt (2018) Using ClassPace in a Flipped Classroom | Odysseyware
Key pedagogical elements of e-learning

Pedagogical scenario (lesson plan)

“A pedagogical scenario is:

- the execution of a learning activity
- the definition of objectives,
- the planification of tasks,
- the description of the learners’ tasks and
- the means of evaluation”

Lando, 2003
Key pedagogical elements of e-learning

Content chunking strategies

- **Classify and prioritise** what is essential to learn.
- **Group content** into modules and then sections according to themes/topics.
- **Organise information** according to a rational flow from basic or broad concepts to more complex ones.

Adapted from Pappas (2013)
Key pedagogical elements of e-learning

Learning objectives

- Learning objectives define what you want your learners to be able to do at the end of the training (course, exercise, etc.).

- A learning objective is not an educational purpose.
  - Educational purposes define what the professor wishes to cover (content) and how (methods, progress).
  - However, learning objectives define the objectives from the point of view of the learners. In other words what they will be able to do as a result of learning.
Key pedagogical elements of e-learning

Learning objectives – example of MATLAB and Octave for beginners

MATLAB and Octave for Beginners
Learn MATLAB and Octave and start experimenting with matrix manipulations, data visualizations, functions and mathematical computations.

65,484 already enrolled!

Enroll
Starts Jun 22
### Key pedagogical elements of e-learning

Learning objectives – example of MATLAB and Octave for beginners

<table>
<thead>
<tr>
<th>Difference between a learning objective and an educational purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Educational purpose of the professor:</strong></td>
</tr>
<tr>
<td>▪ The course aims to introduce the software Octave and MATLAB to students following a numerical analysis course.</td>
</tr>
<tr>
<td><strong>Learning objectives from the point of view of the learners:</strong></td>
</tr>
<tr>
<td>By the end of the course, the learner will be able to:</td>
</tr>
<tr>
<td>▪ “Work with vectors and matrices.”</td>
</tr>
<tr>
<td>▪ “Process text files containing data.”</td>
</tr>
<tr>
<td>▪ “Manipulate plots and figures and save them to pdf or jpg.”</td>
</tr>
<tr>
<td>▪ “Use scripts and functions.”</td>
</tr>
<tr>
<td>▪ “Write small interactive programs.”</td>
</tr>
</tbody>
</table>
Key pedagogical elements of e-learning

Learning objectives

- To define the learning objectives of your course, start by asking yourself what your learners should be capable of knowing and/or doing following the course.

- It will lead to the definition of the general (primary) objective of the course (i.e. the expected results of the learning).

<table>
<thead>
<tr>
<th>General objective</th>
<th>“At the end of the (online or blended learning) course, the learner will be able to”</th>
</tr>
</thead>
</table>

Example: At the end of the course, the learner will be able to use the software Octave and MATLAB to write functions, calculate vectors and matrices and plot graphical representations of results.
Key pedagogical elements of e-learning

Learning objectives

- “Through which intermediary steps do my learners have to go through to reach this objective?”
- This will define the secondary objectives and as a result:
  - your ‘chunks’ (the content and activities) and
  - pedagogical methods to enable your learners to reach these objectives.

| Secondary objectives | « At the end of the section, the learner will be able to... » |

Example: “Work with vectors and matrices.”
Key pedagogical elements of e-learning

Learning objectives

When you identify the secondary objectives, you should always check their relevance to the general objective:

- “Is this learning necessary to reach the general objective of the course?”
- If the answer is no: this learning, as interesting as it may be, should not be part of this course (or your general objective needs revising).

| Example |
|-----------------|------------------------------------------------|
| General Objective | At the end of the course, the learner will be able to use the software Octave and MATLAB. |
| Secondary objective 2 | “Process text files containing data.” |
| Secondary objective 1 | “Work with vectors and matrices.” |
Key pedagogical elements of e-learning

Learning objectives (SMART)
An objective must:
- reflect an observable behaviour
- be drafted using measurable action verbs (e.g. write, define, apply, demonstrate …)

To define this action precisely, ask yourself two questions:

1. In which domain is the learning?

<table>
<thead>
<tr>
<th>Cognitif</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective</td>
<td>Values and attitudes</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>Skills</td>
</tr>
</tbody>
</table>
Key pedagogical elements of e-learning

Learning objectives

2. What is the level of complexity of the learning?

- Remember
  - Recognizing and recalling facts
- Understand
  - Understanding what the facts mean
- Apply
  - Applying the facts, rules, concepts, and ideas
- Analyze
  - Breaking down information into component parts
- Evaluate
  - Judging the value of information or ideas
- Create
  - Combining parts to make a new whole

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Pedagogical approaches

- Describes the approach adopted by the professor to enable learning and reach his/her pedagogical objective.

The following pedagogical approaches to designing an online course will be covered during the training:

- **Transmissive approaches** – transmit knowledge as a presentation, case study, detailed example or a demonstration.

- **Individual active approaches** – learners play an active role.

- **Collaborative active approaches** – learners are brought to collaborate.
Four main platforms offering privileged access to online content

1. Coursera (https://www.coursera.org/campus/) – institutional registration required
   - over 3’000 courses
   - 5’000 codes/university
   - Now – Sept. 30
MOOCs and Online training platforms

Four main platforms offering privileged access to online content

2. edX (https://www.edx.org/covid-19) – institutional registration required
   - over 2’500 courses
   - 5’000 codes/university
   - June 30 reg. limit!
   - till course ends
MOOCs and Online training platforms

Four main platforms offering privileged access to online content


- request by e-mail to AAU
- approx. 500 courses
- No student limit
MOOCs and Online training platforms

4 main platforms offering privileged access to online content

4.1 IBM Africa Skills Academy
primarily for faculty/instructors on emerging IT (AI, Big Data, Blockchain, Cloud Computing, Cybersecurity, IOT, etc)

4.2 IBM Academic Initiative
free access to IBM resources for training and research

4.3 IBM Digital Nation Africa
fast digital competency training for students with no IT background
Structure of a MOOC

General information

MATLAB and Octave for Beginners
Learn MATLAB and Octave and start experimenting with matrix manipulations, data visualizations, functions and mathematical computations.

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Starts Jun 22

☐ I would like to receive email from EPFLx and learn about other offerings related to MATLAB and Octave for Beginners.
Structure of a MOOC

Presentation of a course

- Lesson/chapter
- Sections
- Activities

<table>
<thead>
<tr>
<th>Chapter 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Variables</td>
</tr>
<tr>
<td>2.2 Vector operations</td>
</tr>
<tr>
<td>2.3 Matrix operations</td>
</tr>
<tr>
<td>2.4 Vector and matrix multiplications</td>
</tr>
<tr>
<td>2.5 Elementwise operations</td>
</tr>
<tr>
<td>Reading and complementary exercises</td>
</tr>
<tr>
<td>Chapter 2 Test Homework</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Scripts and algorithms</td>
</tr>
<tr>
<td>3.2 Writing to a file</td>
</tr>
<tr>
<td>3.3 2D figures</td>
</tr>
<tr>
<td>3.4 3D figures</td>
</tr>
<tr>
<td>Reading and complementary exercises</td>
</tr>
</tbody>
</table>
Structure of a MOOC

Recorded lesson
Structure of a MOOC

Exercise and Summative assessment

Chapter 4 Test

Test 4.1

Guess the number!

The rules of the game are the following:

1. For \( a < b \) integers, the computer thinks of an integer inside the interval \([a, b]\) (cf. help randi).
2. The player tries a first guess of the number.
3. The computer replies, depending whether the guess is too low, correct or too high.
4. The player makes another guess, and carries on until he finds the correct number.

Write a function which takes as input two numbers \( a \) and \( b \) and asks the user to play with it. The function does not return anything.

The function must contain the following steps:

- [ ] have a \( \text{help} \).
- [ ] deal with the cases where \( a \) and \( b \) are swapped or when they are not integers.
- [ ] generate a number to guess in the correct interval, and not change it during the game!
- [ ] have a loop which allows the user to keep on playing until he finds the correct number.

Implement the game, test it, then answer the following questions:
Structure of a MOOC

Discussion forum

1.4.3 - Confused
I got the answer OK for the USA...

1.4.2 very confused...
In the answer for 1.4.2, they are...

AQ1.4.2 Hint
You first have to find out what area is required by 1 No. of Panel having 270 Wp. We know under STC, that is 1000 Watts per meter. As efficiency is 15% of the generated PV system, so total irradiance required shall be 270/0.15 = 1800 Watts

This means that 1800/1000 = xxxx m² are required to generate 270 Watts; if STC says that 1000 Watts are required for 1 m²

Now, calculate Mega Watt per panel per year. Now calculate Total Panels required. Now calculate total area taken by the panels. Now finally calculate total area percentage

Percentage of areas in the table
The given percentages of area n...

1.4.2 - Took forever but got it!

Add a Response

1 réponse
Integrate a MOOC into your course

Fill in the following template for one of your courses before the next webinar (1 July)

<table>
<thead>
<tr>
<th>Template to Integrate a MOOC or OER in a Pedagogical Scenario</th>
</tr>
</thead>
</table>

Please fill in the template based on one of your courses for which you would like to use parts of a MOOC from the following platform: [http://e-learning.seneformation.net](http://e-learning.seneformation.net)

<table>
<thead>
<tr>
<th>Title of the course</th>
</tr>
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<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>General objective</th>
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<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Target audience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Prerequisites</th>
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</table>
Integrate a MOOC into your course

Indicate in which module you are thinking of integrating a MOOC.

- The titles of the modules and learning objectives in your existing course
- **The elements of the MOOC, whether it is the entire MOOC, a module or a resource, in BOLD**

<table>
<thead>
<tr>
<th>Title of the module</th>
<th>Learning objectives</th>
<th>Title of the MOOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td></td>
<td></td>
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<tr>
<td>Module 2</td>
<td></td>
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<tr>
<td>Module 3</td>
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<tr>
<td>Module 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Next steps and calendar

- Identify the MOOC you wish to use on the platforms
- Fill in the template on integrating a MOOC/OER in your learning scenario (see the resources linked to module 1)
- Check out the resources available at: http://e-learning.seneformation.net
- Participate in discussions in the online forum linked to webinar 1
- Participate in the next webinar on Wednesday 1 July at 12am GMT on the theme: The essentials of a learning strategy