BECK - Work Package 2

T. 2.1. Development of a common framework for BECK curricula

A report of the BECK Project WP2: Integrating education with consumer behavior relevant to energy efficiency and climate change at the Universities of Russia, Sri Lanka and Bangladesh (BECK)

Integrating education with consumer behaviour relevant to energy efficiency and climate change at the Universities of Russia, Sri Lanka, and Bangladesh

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T. 2.1. Development of a common framework for BECK curricula

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P13 - University of Barisal (BU) - Bangladesh

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P3 - Tallinn University of Technology (TTU)

Italy

P7 - Alma Mater Studiorum – University of Bologna (UNIBO)

Russia

P4 - Moscow State University of Civil Engineering (MGSU)

P5 - Kaliningrad State Technical University (KSTU)

P8 - Peter the Great St.Petersburg Polytechnic University (SPbPU)

P9 - International Public Organization of Assistance to Construction Education (ASV)

P10 - M. V. Lomonosov Moscow State University (MSU)

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P6 - University of Ruhuna (UoR) – Sri Lanka

P12 - University of Colombo, Sri Lanka (UoC)

P14 - University of Moratuwa, Sri Lanka (UoM)

Bangladesh

P11 - Patuakhali Science and Technology University (PSTU)

2. Summary of the report

This report consists of the relevant findings and recommendations for the WP2 – T.2.1. Development of a common framework for BECK MOOC (Massive Open Online Course) curricula. The report comprises of 04 main sections.

1. WP2 introduction and overview
2. Common framework for BECK curricula and Recommendation
3. Proposed MOOC Modules
4. Annexure - Existing common philosophical and pedagogical understanding and capabilities of the partner institutions

The first section gives the overview of the WP2 and the task 2.1 which is explained in detailed in the following sections. The section two defines the components of the Common framework for BECK curricula. The components start from the identification of the appropriate issues for cross-institutional module sharing which summaries the current state of the PCHEI (Partner Country Higher Education Institutions) to develop, accommodate, implement and share MOOC courses including the available resources and development suggestions. The next component of the framework is the findings of the Work Package 1 – BECK Capacity Building Framework which explains the proposed recommendations based on the initial inter institutional survey. The next components recommend the use of Bloom's Taxonomy, Open Pedagogical Practices and OpenupEd Quality Benchmarks in MOOC curricular development to maintain the consistency in all PCHEI MOOC modules and curricular. The section is followed by the conclusion which provides recommendations for the PCHEIs in developing the BECK curricular using the components mentioned in the framework. Section three demonstrates the list of proposed MOOC modules from all the PCHEI. The section four consists of the annexures of existing common philosophical and pedagogical understanding and capabilities of the partner institutions.

This report shall be referred from all the PCHEI when developing the curricular for the proposed BECK MOOC courses. The recommendations and suggestions shall be accommodated to the maximum possible extent in the proposed curricular, hence all the MOOC courses will follow the same structure while maintaining the quality and consistency in the module outcomes.

2.1. WP 2 – Tasks

T.2.1. Development of a common framework for BECK curricula.

T.2.2. Development of a common approach to learner-centred and real problem-based teaching and lifelong learning activities.

T.2.3. Training of teaching staff.

T.2.4. Development of BECK MOOC modules specifications and teaching (learning) materials and adaptation to different learning contexts and different cycles of studies to different stakeholders.

T.2.5. Assessment, recognition and certification of the developed BECK MOOC modules by universities in Russia, Bangladesh and Sri Lanka and integration to different cycles of corresponding studies.

3. Work Package 2 – Overview

The objective of the WP2 is to create a suitable basis for education in the field consumer's behaviour related to energy efficiency and climate change in the built environment (BECK) by introducing integrated, multidisciplinary BSc, MSc and PhD adaptive, recognised and certificated MOOC modules to existing study programmes in Russian, Sri Lanka and Bangladesh universities.

WP2 will be completed as follows:

1. Preparation of the framework report for the common BECK curricula. The report will describe the common philosophical, pedagogical and practical understanding and capabilities of the partner institutions forming the basis for BECK adaptive MOOCs development and delivery. The report will be based on findings of WP1 (adopted Capacity Needs Assessment Methodology (CAPNAM) for Planning and Managing Education (United Nations 2013), cross-institutional consultations (online questionnaires), and on local visits to discuss and identify in detail any outstanding incompatibility issues.

2. Preparation of the report on common grounds for teaching and learning. The report will describe commonly usable learner-centred and real problem-based teaching and lifelong learning mechanisms. It will form the basis for finer BECK adaptive MOOCs module details with relation to delivery mode, credit basis, etc. BECK adaptive MOOCs will be based on common resource and infrastructure capabilities but built upon the expertise of various partner institutions to ensure good practice sharing at national and regional levels. The report will be based on cross institutional consultations through online questionnaires.

3. Training of teaching staff. The framework report for the common curricular and the report on common grounds for teaching and learning will be presented and discussed during the workshop to be organized in Vilnius, held by Vilnius Gediminas Technical University. During the workshop teachers will gain competences necessary for development of the new MOOC modules and student-centred teaching approaches.

4. Development of the BECK adaptive MOOCs content and teaching materials suitable for innovative delivery mechanisms as proposed in the WP3.

Since the BECK adaptive MOOCs content will be influenced by the findings of the previous reports, the new knowledge creation and dissemination will be triangularised with education (input from existing BECK module base), innovation (new online delivery and dissemination strategies as described in the WP3 and through institutional (built environment organizations) and research (through the shared research base across institutions).

The BECK adaptive MOOCs intended to be developed will usually comprise three main integrated parts: (a) consumer's behaviour related to energy efficiency, (b) climate change, and (c) the integration of the above-mentioned parts (a) and (b).

In total 24 adaptive MOOCs (7 BSc/specialists, 11 MSc, 6 PhD) will be developed.

4. WP2 – T.2.1. Development of a common framework for BECK curricula

4.1. Description

The report will describe the common philosophical and pedagogical understanding and capabilities of the partner institutions forming the basis for BECK adaptive MOOCs development and delivery. The report will be based on findings of WP1 (adopted Capacity Needs Assessment Methodology (CAPNAM) for Planning and Managing Education (United Nations 2013), cross-institutional consultations (online questionnaires), and on local visits to discuss and identify in detail any outstanding incompatibility issues.

As mentioned in the BECK wider objective the proposed curricular should always be aimed to upgrade and harmonize the multidisciplinary adaptive MOOC modules on environmental protection technology in the Russian, Sri Lankan, and Bangladesh universities. Consequently, the project should be able to increase their capacity to continually modernize, enhance the quality and relevance of education of students to the global market needs and to ensure international cooperation.

The proposed MOOC modules should always be adhered to the following objectives.

- To upgrade curricula of BSc/specialists, MSc and PhD programmes in Russian, Sri Lanka and Bangladesh universities by adding 16 new multidisciplinary adaptive, recognized and certificated MOOC modules on consumer behavior related to energy efficiency and climate change, to enhance the quality and relevance of education in PC and EU universities to global issues.
- To transfer European practices in education (learning and teaching tools, methodologies and pedagogical approaches including learning outcomes and ICT-based practices) from participating EU universities to PC universities.
- To assist competence development of teachers within PC universities.
- To develop the Simulated Big Data Interuniversity Networked Affective Educational Centre to encourage use of ICT-based methodologies in education and research.
- To strengthen educational and scientific networking among EU and PC universities in the BECK field.

The framework report for the common curricular will define the content to be learned in terms of clear, definable criteria of what the student should know and be able to do. It will be student-centred and differentiated, based on students' ability, interests, backgrounds, local culture, traditions, and values.

5. Common framework for BECK curricula and Recommendation

The framework for BECK Common Curricular development is the guide to reconsider the capacity development needs identified in the WP 1 capacity needs assessment and to incorporate the potential cross institutional opportunities to effectively establish the MOOC system within the PCHEI. The framework can be mainly used on the following objectives.

- To upgrade curricula of BSc/specialists, M.Sc. and Ph.D. programmes in Russian, Sri Lanka and Bangladesh universities.
- To incorporate the WP1 - Capacity Development Needs in the MOOC module development.
- To ensure the cross-institutional capacity needs are addressed within the MOOC module development.
- To strengthen educational and scientific networking among EU and PC universities in the BECK field.

The framework contains five components.

1. BECK Capacity Building Framework from WP1
2. Identification of the available issues for cross-institutional module sharing
3. Bloom's Taxonomy of education objectives
4. General components of the Pedagogical Practices
5. Components of the OpenupEd Quality Benchmarks

The BECK Capacity Building Framework provides insights on the 07 key focal areas in capacity building where each PCHEI should pay their attention. Based on these focal areas PCHEI can focus on developing the MOOC curricular with the guide of Pedagogical Practice and OpenupEd Quality Benchmarks. The guide of Pedagogic Practice will support the PCHEI in framing the key requirements in the MOOC Curricula along with the PC Cross-Institutional requirements and potentials supported by the OpenupEd quality benchmarks to maintain the intended standards.

5.1. BECK Capacity Building Framework WP1

The findings of the WP1 and the Capacity Building Framework provides significant inputs to the development of a common framework for beck curricula. The findings of the WP1 has been summarized into 7 categories which comes into the scope of BECK project and within the capacities of project proponents.

1. Infrastructure development
2. Curricular development
3. Institutional integration and networking
4. Awareness raising
5. Capacity building
6. Research and development
7. Financial support

Among these categories' curricular development can be identified as the requirements to be addressed in the content of the MOOC curricular, whereas, research and development, infrastructure development, institutional networking, awareness raising, capacity building, and financial support can be identified as to supporting platforms for the development and implementation of MOOC courses.

i.   WP1 findings for MOOC curricular development

Curricular Development to integrate education with consumer behaviour relevant to energy efficiency and climate change

- Introduce newly developed curricular on new course modules, e-learnings courses and MOOC
- Restructure the PCHEI curricula on energy efficiency standards
- Integration of curricula with energy efficiency and climate change
- Curricular improvement incorporating European educational practices
- Prioritize consumer behavior on energy efficiency and climate change
- Technical capacity improvement in curricular development
- Uniform curricular design methodology and adaptation of European best practices
- Development of curriculum development expert consortium
- Upgraded curricula and online offering platforms
- Practice of European modern learning, teaching tools and methodologies

ii.   WP1 findings for MOOC platform development and implementation

Research and development to integrate education with consumer behaviour relevant to energy efficiency and climate change

- Platforms for conducting research
- Appropriate education and research opportunities
- Facilitate with sufficient resources for research and innovation activities
- An organized approach and framework for knowledge and research contribution.

Infrastructure development to Integrate education with consumer behaviour relevant to energy efficiency and climate change

- Creation of an information system for module sharing among PCHEI
- Provide quality training platform to teaching staffs on MOOCs
- Develop modern learning, teaching tools and methodologies for MOOCs
- Develop modern information technology based educational system to PCHEI
- Create facilities to develop teaching learning material support on modern program-based tools
- Integration of MOOCs courses into existing educational programs

Integration and networking to integrate education with consumer behaviour relevant to energy efficiency and climate change

- Networking among PCHEI and related institutions to enhance the strength of integrated education especially European learning and teaching methods
- Organization internships for teaching staff and students
- Adaptation of European best practices
- Strengthen university industry collaboration
- Innovative teaching methods and European practices
- New partnerships with foreign universities and organizations to share knowledge and technologies

Awareness Raising to integrate education with consumer behaviour relevant to energy efficiency and climate change

- Raise academic awareness on consumer behaviour relevant to energy efficiency and climate change
- Awareness on user behaviors and consumption
- Education, training, and public awareness issues relating to climate change
- Awareness programs for both students and public

Capacity Building to integrate education with consumer behaviour relevant to energy efficiency and climate change

- capacity building development of academic and technical staffs on consumer behaviour relevant to energy efficiency and climate change
- Skills in digital economy (big data, AI, machined learning) of PCHEI
- Develop training programs to use new technologies in PCHEI
- capacity building in relevant institutions/departments to support and disseminate the MOOCs

Financial support to integrate education with consumer behaviour relevant to energy efficiency and climate change

- Financial support and platforms to conduct research and development
- Financial support for MOOCs development, implementation, trainings, and material development.

5.2. Findings of the available issues for cross-institutional module sharing

The following criteria have been assessed and evaluated to identify the common philosophical and pedagogical understanding and capabilities of the partner institutions in forming the basis for BECK adaptive MOOCs development and delivery.

1. Promoting cross institutional module sharing
    1.1. Cross institutional partnerships and collaborations
    1.2. Existing inter-university joint programme and module sharing arrangements
    1.3. Opportunities for module development, sharing and delivery in the BECK project
2. Readiness of the university for cross institutional module sharing
    2.1. Language and culture
    2.2. Administrative constraints
    2.3. Defining common assessment criteria
    2.4. Ability to share resources
    2.5. Intellectual Property
    2.6. Access to state of the art technology
    2.7. Sustainability

Existing common philosophical and pedagogical understanding and capabilities of the partner institutions

The partner institutions in the BECK team explained the potentials and constraints each of them possesses in MOOC module development and sharing during the 2nd Coordination and Common Capacity Building Meeting held in June 2019 at University of Huddersfield, UK. It was specifically

highlighted from all the PC institutions that promoting cross institutional module sharing and cross institutional partnerships and collaborations are within the priorities of the institutional goals and also within the national goals of higher education. The PC institutions are already engaged in several inter-university joint programmes and module sharing activities including successful completions and ongoing projects. Therefore, to the BECK MOOC development there are no major constraints in terms of the language, administrative structure and content sharing.

In specific, the PC institutions have mentioned the opportunities for module development, sharing and delivery in the BECK project can be further improved by joint training programmes and resource exchange programmes which may bring mutual benefits for all the PC institutions. In defining the common assessment criteria, it was highlighted to consider on equality of education, diversity of teaching and learning strategies, accessibility of learning materials and sustainability of learning outcomes including formative and summative assessment criteria. The intellectual property rights of the developed content are suggested to be held within the PC institutions while keeping the content and materials open for free access. There is a need of policy requirements and policy implementation to module/ resources shearing among universities. Also, the initiation of a common platform for content sharing and maintenance is highlighted including ICT platforms and expertise knowledge. Access to state-of-the-art technology is also considered as an important aspect including the ability to incorporate the available and possible technologies into the MOOC module development, implementation and teaching and learning. Further it has been highlighted in some of the Asian universities with the need of infrastructure and capacity improvements to accommodate such a system. Sustainability of the system is one of the highly commented components including many suggestions. The following are the commonly mentioned recommendations. Cooperation with industry partners, demand driven and practical considerations, a sustainable financing module, continuous assessment, monitoring, maintain, and updating procedures on shared modules.

The Cross-Institutional Module Sharing prospects can be concluded by mentioning following aspects. The cross socio-cultural aspects, which govern the success of the MOOC programmes should be considered in specific within the project. Poor facilities and ICT knowhow will be a constrain if not properly addressed. No availability of CPD for staff will weaken the system. It is always important to manage a common structure and maintain the continuity. Maintain a user manual and send regular updates. A manual system test should be carried out prior to the system is fully geared to online.

Some of the important prospects and requirements mentioned by the PC institutions are as mentioned.

Ability to share resources

- "Open Network" technical support centre (MGSU)
- The results of CENEAST and MAPREE Tempus projects are to be used for the development of BECK modules (MGSU)
- Starting from the skills and expertise of the University of Bologna staff that is involved in the project, the access to state-of-the-art technology will be carried out through bibliographical and regulatory researches (UniBo)
- Barisal University and Patuakhali Science and Technology University will be the pioneer in cross institutional module sharing in Bangladesh (BU).

Opportunities for module development, sharing and delivery in the BECK project

- None of our university resource personnel/teachers have participate in preparing MOOC modules. Hence, it will be a **challenge** in preparing quality MOOC modules for us (PSTU)
- Moreover, appropriate **training** will be necessary for ensuring quality MOOC (PSTU).
- We do not have any obligation to prepare, share and delivery MOOC modules to the BECK Project (as we made agreement with BECK) (PSTU).
- MOOC is new area for PSTU. We believe, PSTU will be benefited from BECK project in preparing and sharing MOOC modules (PSTU).
- The BECK MOOC module that will be developed by the University of Bologna could constitute a new online course within the BOOK (UniBO Open Knowledge) website (UniBO).
- The international dimension of the University of Bologna guarantees a wide diffusion of the project, which could also become attractive for other countries (UniBO).
- Training and pedagogic practice in integrated education on consumer behaviour relevant to energy efficiency and climate change (UoC).
- UoR, UoC and UoM are collaboratively working towards implementing new policies on HEIs in Sri Lanka on this learning platform (UoR).
- Higher education plays an important role in shaping the capacity of the work force and in fostering research and innovative thinking (ADB, 2012) (BU).
- BU has unlimited high-speed internet facilities. Therefore, BU has sufficient ICT to adapt latest technology to succeed cross institutional module sharing (BU).

Administrative constraints

- MGSU BECK team has the administrative support of vice-rector of international activity (MGSU).
- Teachers have the freedom to develop curricula (MGSU).
- Administrative procedure of MOOC approval will take at least 6 months (PSTU).
- Easy with ERASMUS partners (TTU).
- Approval and accreditation to offer courses on the topic from tertiary educational bodies and committees within the university and the University Grants Commission, in accordance to the Sri Lankan Quality Framework (SLQF) (UoC).
- Content and the delivery will be overseen by international accreditation bodies and should comply with their observations (UoM).
- BU administration have very flexible governance arrangements which would help in the development and delivery of shared modules (BU).

Access to state-of-the-art technology

- MGSU as the National Research University is producing new technologies (MGSU).
- The modern technological solutions are to be implemented in the curricula (MGSU).
- We have virtual classroom, cyber center, geo-information science and earth observation lab along with high speed internet facility to carry out the cross institutional module sharing (PSTU).
- In addition, PSTU has experience in directing e-learning during 2008-2012 with the help of CDMP, Bangladesh (PSTU).

- Starting from the skills and expertise of the University of Bologna staff that is involved in the project, the access to state-of-the-art technology will be carried out through bibliographical and regulatory researches (UniBo).
- Lack of online platforms (The virtual campus of the university merely coordinates programmes and does not have the online platforms to run the programmes) (UoC).
- UoR uses the Moodle environment for e-Learning facilities and used for disseminating purposes on presentations, lecture notes, assessments etc. (UoR).
- BU would be able to provide virtual campus, open educational resources with the aid of high-speed internet connection (BU).

5.3. Bloom's Taxonomy of education objectives

The bloom's taxonomy of educational objectives is a framework for classifying statements of what we expect or intend students to learn as a result of instruction (Krathwohl, 2002). The original Taxonomy provided carefully developed definitions for each of the six major categories in the cognitive domain. The categories were Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. They were arranged in a cumulative hierarchical framework; achievement of the next more complex skill or ability required achievement of the prior one.

(ThingLink)
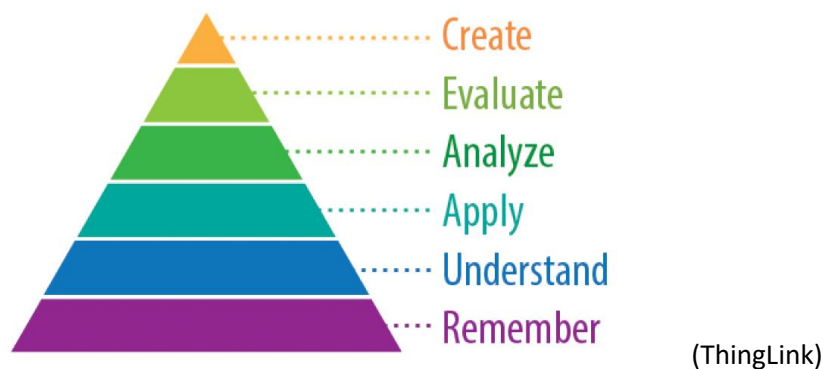
1. Remembering: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
2. Understanding: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
3. Applying: Carrying out or using a procedure for executing or implementing.
4. Analyzing: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
5. Evaluating: Making judgments based on criteria and standards through checking and critiquing.
6. Creating: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

Bloom's taxonomy is a powerful tool to help develop learning objectives because it explains the process of learning:

- Before you can understand a concept, you must remember it.
- To apply a concept, you must first understand it.
- To evaluate a process, you must have analyzed it.

- To create an accurate conclusion, you must have completed a thorough evaluation.

Bloom's Level	Key Verbs (keywords)	Example Learning Objective
Create	design, formulate, build, invent, create, compose, generate, derive, modify, develop.	By the end of this lesson, the student will be able to design an original problem-solving principle of CCA into DRR.
Evaluate	choose, support, relate, determine, defend, judge, grade, compare, contrast, argue, justify, support, convince, select, evaluate.	By the end of this lesson, the student will be able to determine appropriate CCA actions for effective DRR implementation.
Analyze	classify, break down, categorize, analyze, diagram, illustrate, criticize, simplify, associate.	By the end of this lesson, the student will be able to differentiate between CCA actions and DRR strategies.
Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, perform, present.	By the end of this lesson, the student will be able to define CCA actions in DRR.
Understand	describe, explain, paraphrase, restate, give original examples of, summarize, contrast, interpret, discuss.	By the end of this lesson, the student will be able to describe CCA and DRR in her/his own words
Remember	list, recite, outline, define, name, match, quote, recall, identify, label, recognize.	By the end of this lesson, the student will be able to recite climate change adaptation (CCA) into disaster risk reduction (DRR).

("Using Bloom's Taxonomy to Write Effective Learning Objectives | Teaching Innovation and Pedagogical Support,")

Steps towards writing effective learning objectives:

i. Make sure there is one measurable verb in each objective.
ii. Each objective needs one verb. Either a student can master the objective, or they fail to master it. If an objective has two verbs (say, *define* and *apply*), what happens if a student can define, but not apply? Are they demonstrating mastery?
iii. Ensure that the verbs in the course level objective are at least at the highest Bloom's Taxonomy as the highest lesson level objectives that support it. (Because we cannot verify, they can evaluate if our lessons only taught them (and assessed) to define.)
iv. Strive to keep all your learning objectives measurable, clear, and concise.

("Using Bloom's Taxonomy to Write Effective Learning Objectives | Teaching Innovation and Pedagogical Support,")

5.4. General components of the Pedagogical Practices

Pedagogical framework is designed to support teachers in the delivery of quality teaching and learning that will improve student learning (Hegarty, 2015). The model resource includes information on getting started with using the model to plan, reflect upon and improve teaching practice. The components in the pedagogical practice provide the guide to consider the potentials within the PCHEI

into the development and improvements in the MOOC curricular development and identify their potentials to support the PCHEI in need of the development support. Further details of the cross-institutional assessment can be identified in the Annexure section.

The components can be identified as mentioned below.

i.   Participatory Technology

Ensure critical approaches to knowledge with user participation. Supporting personalized learning.

ii.   Innovation and creativity

PCHEI should attempt to produce and practice new technologies including E-learning. Availability of Technical Support Centres.

iii.   Reflective practice

The access to state-of-the-art technology should be carried out through bibliographical and regulatory researches. The BECK MOOC module guides could be used in constituting new online courses.

iv.   Learner Generated

Providing ways for learners to promote and share their work.

v.   People, openness, trust

Ensure the competencies in open and network literacy. Implement modern technological solutions in the curricula.

vi.   Sharing ideas and resources

PCHEI should be benefited from BECK project in preparing and sharing MOOC modules. Ability to share the skills and expertise regarding the access to state-of-the-art technology.

vii.   Connected communities

The international dimension of the project can guarantee a wide diffusion, which could also become attractive for other countries.

viii.   Peer review

Previous experiences on similar projects and lessons learnt. Foster collaboration and peer review.

5.5.   OpenupEd quality benchmarks for MOOC curricular development

To ensure the quality of adaptive MOOCs, special guidelines and accreditation rules will be developed and adopted in each participating PC university. For this purpose, Manual for Quality Assessment for E-learning (2012) by European Association of Distance Teaching Universities (EADTU) and OpenupEd quality benchmarks (http://www.openuped.eu/) will be used (European Association of Distance Teaching, 2012).

The *OpenupEd* consists of a framework of common features for MOOCs that puts the learner at the center in the teaching and learning process. Following are the key aspects of the framework.

- Learner-centred

- Openness to learners
- Digital openness
- Independent learning
- Media-supported interaction
- Recognition options
- Quality focus
- Spectrum of diversity

i.   Learner-centered

MOOCs should be designed such that all unnecessary barriers to learning are removed, while aiming to provide students with a reasonable chance of success in an education. But that goes beyond offering a course freely online, even if they are in the local language. In open education we should also have a learner centered approach. I.e. we should focus more on innovations in open pedagogical thinking and less on technology and platforms.

Courses should aid students to construct their own learning from a rich environment, and to share and communicate it with others; they should not simply focus on the transmission of content knowledge to the student.

Openness in education is also about the learned centred activities, which are carefully designed by the teaching staff. Here, the core question is "how does good learning proceed as a process" in a potentially rich environment.

ii.   Openness to learners

This captures aspects such as: open entry (no formal pre-requisites), freedom to study at time, place and pace of choice, flexible pathways, suitability for a wide variety of lifelong learners. In a broader perspective this feature stresses the importance of being open to learners' needs.

Massive Open Online Courses should be designed as open as possible, in such a way that all unnecessary barriers to learning are removed, both at the entry into learning and along the learning path.

The following dimensions have been introduced:

Free of charge: Full course experience for free-of-charge. For additional services, like personal tutoring or doing a formal exam for obtaining an ECTS certificate, there will be some cost involved.

Free admittance: An open entry policy is applied. Anyone can basically participate regardless of prior education. However, that does not imply that MOOCs are only offered at novice level. All MOOCs require some basic skills of ICT and language skills. And there are courses that require extensive prior knowledge and skills. But these knowledge and skills are not tested beforehand, nor are any formal qualification needed to enter the course.

Open Accessibility: Course can always be accessed by anyone anywhere if they have an internet connection.

Learn anywhere online: The freedom of place to study at home, at work, at a library, virtual classroom, on a train or a plane, abroad, on a boat etc.

Start anytime: Begin a course at any point during the year and study at any time.

Self-paced: Determine the own pace and schedule. Self-paced MOOCs will need to be finished with recognition and consequently have an end date (set by the learner).

Open programming: The programmes involve certain freedoms as regards their content and order; Necessary combine modules/courses can be undertaken. There are partial programmes and complete open programmes available.

In a broader perspective this feature stresses the importance to be open to learners' needs. I.e. education should be affordable, rewarding, good quality, feasible, enjoyable, but also with freedom of time / pace / place, open entry, open programming, credentialing, bridge between formal and informal learning, lifelong learning.

iii.   Digital openness

Courses should be available online for free but in addition apply open licensing so that material and data can be reused, remixed, reworked and redistributed (e.g. using CC-BY-SA or similar). Learner-centred approach Courses should aid students to construct their own learning from a rich environment, and to share and communicate it with others; they should not simply focus on the transmission of content knowledge to the student.

Digital openness has various domains to which it can relate; open source (for software), open access (for scientific output), open content, open educational resources (for learning materials). A central issue to all these forms of digital openness, in contrast to standard copyright, is that it is free available and has an open license. For open content and open educational resources Creative Commons has developed a system of open licenses which are fit to different circumstances and which are meanwhile commonly applied.

Open licence: (re-)use. The user has the rights to reuse, revise, remix, and redistribute content or courses. The open licence is an important business driver for promoting skills, enhancing knowledge transfer and increasing the pace of innovation.

The OpenupEd aims to be in these 5R' domains of the digitally open world (Retain, Reuse, Revise, Remix, Redistribute) as much as possible. As a rule, the OpenupEd courses should be openly licensed, for example CC BY or CC BY SA.

iv.   Independent learning

A MOOC should provide high quality materials to enable an independent learner to progress through self-study.

In higher education students usually are guided throughout the curriculum by teaching staff in classrooms, by books and readers and in virtual learning environments. A MOOC, however, should provide high quality materials and a rich learning environment to enable an independent learner to progress through self-study.

Built-in support & tutoring. Since independent learning is the 'holy grail' of higher education, built-in guidance is needed to optimize the learning process and to support you for learning on your own. As such, the user will become a more independent learner and will need less guidance than in the first

courses. Independent learning is also essential to move forward in the further academic or professional development in life. Personal tutoring is optionally available with some courses.

v. Media-supported interaction

Course materials should make best use of online affordances (interactivity, communication, collaboration) as well as rich media (video and audio) to engage students with their learning.

vi. Recognition options

Successful course completion should be recognised as indicating worthwhile educational achievement.

OpenupEd partners offer a full/complete course experience including informal recognition options for free. Moreover, MOOC participants should be offered a pathway to formal higher education and as such should also be offered the possibility to a formal credit (to be paid for).

In addition, the majority of OpenupEd MOOCs provide the possibility to obtain a formal certificate, i.e. official credits that can count towards obtaining a degree, i.e. ECTS (European Credit Transfer and accumulation System).

Full Course Experience: MOOCs is identified as a complete course experience including:

- educational content
- facilitation interaction among peers (including interaction with academic staff)
- activities/tasks, tests, including feedback
- some kind of (nonformal) recognition options
- a study guide / syllabus

The total study time of a MOOC is minimal 1 ECTS (typically between 1 and 4 ECTS).

vii. Quality focus

There should be a consistent focus on quality in the production and presentation of a MOOC. A high-quality course is essential for an optimal chance of study success. OpenupEd aims to be a distinct quality brand embracing a wide diversity of (institutional) approaches to open education via the use of MOOCs. Therefore, OpenupEd partners may agree that the quality process should be one that is tailored to both e-learning and open education.

The quality of our MOOCs is assured on three levels.

Quality assured: Every OpenupEd partner has an internal Quality Assurance system in place to approve a MOOC and apply the OpenupEd Quality Label.

Accredited: OpenupEd MOOCs are also part of an accredited curriculum and as such (part of) the course is subject to the national quality system (e.g. national accreditation organisation).

EFQ level: For all courses, the EQF level is indicated.

In short: OpenupEd provides you with real opportunities to participate in higher education and provides quality learning opportunities to all.

A course should be inclusive and accessible to the wide diversity of citizens. OpenupEd MOOCs can be used in local case studies embracing the diversity in institutional approaches to open education using MOOCs.

OpenupEd supports diversity: a course should be inclusive and accessible to the wide diversity of citizens. In short: it should appeal to everyone. As stated earlier it's all about putting the learner at the center.

Diversity: OpenupEd cherish diversity in languages and cultures, a spectrum of approaches and contexts, accounting for variety and profiling. Diversity as one of the key advantages of new learning technologies.

7. Conclusion

The development of a common framework for BECK curricular needs the comprehensive knowledge and understanding of the present potentials and constraints within the PCHEI to accommodate MOOC courses within their academic structure. The findings of the initial online survey demonstrate that all the PCHEI are positively proposing to accommodate MOOC courses and modules in the existing academic structure and to carryout improvements and developments wherever necessary to implement the MOOC system. The present practices of inter-university joint programme and module sharing arrangements have been identified as potentials in most of the PCHEI to accommodate and share MOOC developments within the HE system. Further it has been identified that the time consumed in the administrative protocols as one of the major constraints in implementing MOOC, however, it can be overcome by undertaking timely actions, as necessary. Every PCHEI has agreed to share the MOOC development among the partners and with other HEI, as necessary. It is proposed by the PCHEI that the sustainability of the MOOC system will depend on the strength of demand and industrial collaboration. Further, it is mentioned that monitoring and financing mechanism also important to maintain the sustainability and quality of the MOOC courses. Also, the MOOC system to be comply with the rules and regulations of the university and higher education authorities. The platform to be used in implementing the BECK courses is a vital consideration of all the PCHEI as some of them might require infrastructure and human capacity improvements to establish and maintain the MOOC system. Therefore, continuous professional development (CPD) programmes has been identified as a key requirement in maintaining the consistency of the programme and cross institutional collaboration.

The WP1 concludes the requirements for BECK capacity building framework. The capacity building framework can be used to maintain the consistency of the MOOC curricular and implementation platform. Mainly the framework suggests restructuring the PCHEI curricular on energy efficiency and climate change and accommodate new MOOC courses in the system. Further, the accreditation, industrial demand, and the prioritization of the proposed MOOC courses on energy efficiency and climate change among the other online courses have been identified as key components in the WP1 Capacity building framework. Apart from the curricular development, the relevant infrastructure, research and development, institutional integration and networking, awareness raising, capacity building and financial mechanism improvements have been suggested in the framework for further recommendations.

In formulating the learning objectives for the MOOC modules, it is recommended to adopt the Bloom's taxonomy with reference to the level of proposed programme. The remember, understand, and apply

stages are most suitable for the bachelor's level courses where the analyze, evaluate and create levels are most suitable for the postgraduate level courses. The objectives can be developed aligned to the taxonomy recommendations following a gradual advancement towards the application to maintain the comprehension and consistency of the objectives.

Pedagogical framework is designed to support teachers in the delivery of quality teaching and learning that will improve student learning. The open pedagogy promotes dynamic, and innovative learner-generated content design. Open methods of communication and interaction are used within a global community of learners who provide peer support and review. The PCHEI can benefit from each other based on the available potentials and partnerships.

To ensure the quality of adaptive MOOCs, Manual for Quality Assessment for E-learning (2012) by European Association of Distance Teaching Universities (EADTU) and OpenupEd quality benchmarks are suggested to be used. The *OpenupEd* consists of a framework of common features for MOOCs that puts the learner at the center in the teaching and learning process. The key aspects of the framework can be followed by each PCHEI in order to maintain the consistency and standards in the MOOC courses (Learner-centred, Openness to learners, Digital openness, Independent learning, Media-supported interaction, Recognition options, Quality focus, and Spectrum of diversity).
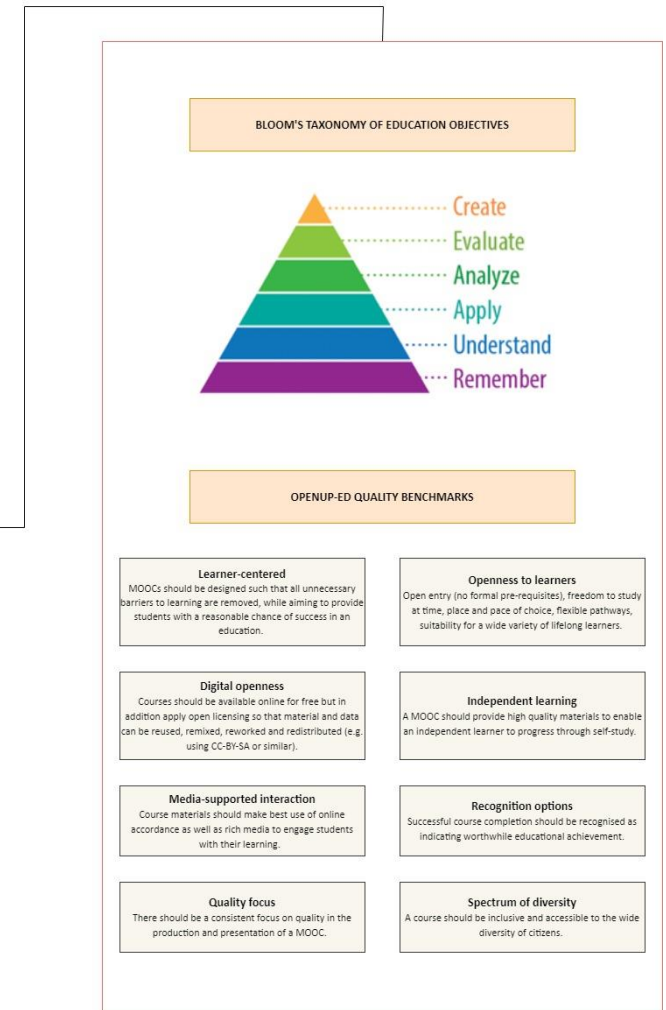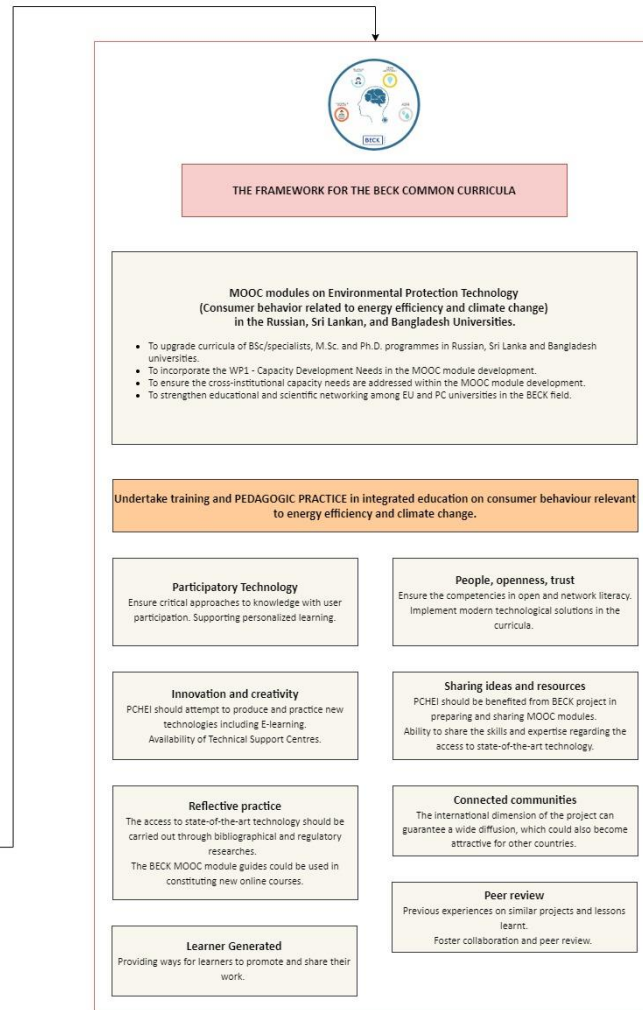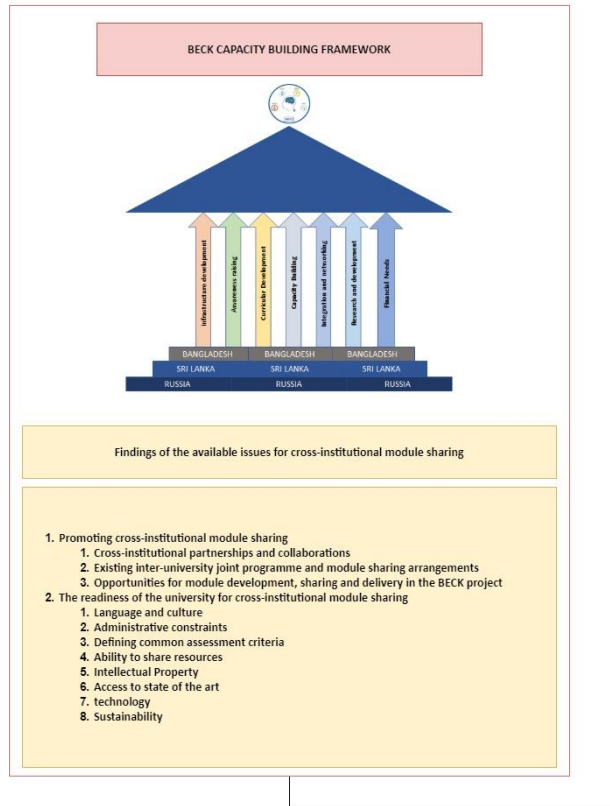
8. Proposed MOOC Modules

No	Title	Level	Institution
1	Green Energy and Climate Change	BSc	PSTU
2	Energy and Climate: Sustainable Development	BSc	BU
3	Sustainable Design and Whole Lifecycle	BSc	UoM
4	Green Behaviour and Personality Development	BSc	UoR
5	Urbanization, Climate Change, Displacement and Relocation	BSc	UoC
6	Energy Efficiency Technology in the Electric Power Industry	BSc	KSTU
7	Land Use and Energy Efficiency	BSc	PSTU
8	Climate Change at Urban and Peri-Urban Scale in Tropics: Impacts, Mitigation and Adaptation	MSc	UoR
9	Adapting Buildings and Cities for Climate Change	MSc	MGSU
10	Qualitative and Quantitative Research on Consumer's Behaviour Related to Energy Efficiency and Climate Change	MSc	MGSU
11	Risk Management of the Transition to Low Carbon Economy	MSc	MSU
12	Renewable Energy: Resources and Technologies for Potential Countries' Market Players	MSc	SPbPU
13	Engineering Response to Climate Change	MSc	UoM
14	Green Built Environment and Climate Change	MSc	VGTU
15	Urban Development and Climate Change	MSc	SPbPU
16	Spatial Urban Planning and Climate Change	MSc	PSTU
17	Simulation of Construction Management Strategies for Energy Efficiency	MSc	TalTech
18	Organization and Methodology of Scientific Research	MSc	KSTU
19	Simulation of Construction Management Strategies for Energy Efficiency	PhD	TalTech
20	Impact of Climate Change on Human Development	PhD	MSU
21	Smart City and Analytics	PhD	VGTU
22	Climate Change Risk Assessment for the Heritage Buildings	PhD	UNIBO
23	Changing Role of Disaster Risk Management	PhD	UoH
24	Climate Change and Disaster Risk Reduction Nexus	PhD	UoH

Summary

	Planned modules in the Application	Total modules proposed by partners to EACEA	Total modules proposed at the 3rd meeting
BSc	7	7	7
MSc	6	11	11
PhD	3	5	6
Total	**16**	**23**	**24**

Co-funded by the
Erasmus+ Programme
of the European Union

9. Common framework for BECK curricula

BECK CAPACITY BUILDING FRAMEWORK

Infrastructure development · Awareness raising · Curricular Development · Capacity Building · Integration and networking · Research and development · Financial Needs

BANGLADESH · BANGLADESH · BANGLADESH
SRI LANKA · SRI LANKA · SRI LANKA
RUSSIA · RUSSIA · RUSSIA

Findings of the available issues for cross-institutional module sharing

1. Promoting cross-institutional module sharing
   1. Cross-institutional partnerships and collaborations
   2. Existing inter-university joint programme and module sharing arrangements
   3. Opportunities for module development, sharing and delivery in the BECK project
2. The readiness of the university for cross-institutional module sharing
   1. Language and culture
   2. Administrative constraints
   3. Defining common assessment criteria
   4. Ability to share resources
   5. Intellectual Property
   6. Access to state of the art
   7. technology
   8. Sustainability

THE FRAMEWORK FOR THE BECK COMMON CURRICULA

MOOC modules on Environmental Protection Technology
(Consumer behavior related to energy efficiency and climate change)
in the Russian, Sri Lankan, and Bangladesh Universities.

- To upgrade curricula of BSc/specialists, M.Sc. and Ph.D. programmes in Russian, Sri Lanka and Bangladesh universities.
- To incorporate the WP1 - Capacity Development Needs in the MOOC module development.
- To ensure the cross-institutional capacity needs are addressed within the MOOC module development.
- To strengthen educational and scientific networking among EU and PC universities in the BECK field.

Undertake training and PEDAGOGIC PRACTICE in integrated education on consumer behaviour relevant to energy efficiency and climate change.

Participatory Technology
Ensure critical approaches to knowledge with user participation. Supporting personalized learning.

People, openness, trust
Ensure the competencies in open and network literacy. Implement modern technological solutions in the curricula.

Innovation and creativity
PCHEI should attempt to produce and practice new technologies including E-learning.
Availability of Technical Support Centres.

Sharing ideas and resources
PCHEI should be benefited from BECK project in preparing and sharing MOOC modules.
Ability to share the skills and expertise regarding the access to state-of-the-art technology.

Reflective practice
The access to state-of-the-art technology should be carried out through bibliographical and regulatory researches.
The BECK MOOC module guides could be used in constituting new online courses.

Connected communities
The international dimension of the project can guarantee a wide diffusion, which could also become attractive for other countries.

Peer review
Previous experiences on similar projects and lessons learnt.
Foster collaboration and peer review.

Learner Generated
Providing ways for learners to promote and share their work.

BLOOM'S TAXONOMY OF EDUCATION OBJECTIVES

Create
Evaluate
Analyze
Apply
Understand
Remember

OPENUP-ED QUALITY BENCHMARKS

Learner-centered
MOOCs should be designed such that all unnecessary barriers to learning are removed, while aiming to provide students with a reasonable chance of success in an education.

Openness to learners
Open entry (no formal pre-requisites), freedom to study at time, place and pace of choice, flexible pathways, suitability for a wide variety of lifelong learners.

Digital openness
Courses should be available online for free but in addition apply open licensing so that material and data can be reused, remixed, reworked and redistributed (e.g. using CC-BY-SA or similar).

Independent learning
A MOOC should provide high quality materials to enable an independent learner to progress through self-study.

Media-supported interaction
Course materials should make best use of online accordance as well as rich media to engage students with their learning.

Recognition options
Successful course completion should be recognised as indicating worthwhile educational achievement.

Quality focus
There should be a consistent focus on quality in the production and presentation of a MOOC.

Spectrum of diversity
A course should be inclusive and accessible to the wide diversity of citizens.

10. Annexure

P3 - Tallinn University of Technology (TTU)

Promoting cross institutional module sharing	
Cross institutional partnerships and collaborations	• Will be determined based on WP-1 gaps and needs in Sri Lankan, Bangladeshi and Russian universities
Existing inter-university joint programme and module sharing arrangements	• TalTech has existing joint programs of staff exchange. • PostDoc from VGTU in TalTech will deliver part of the module
Opportunities for module development, sharing and delivery in the BECK project	• There are a lot of ERASMUS joint recognition agreements
Readiness of the university for cross institutional module sharing	
Language and culture	• English
Administrative constraints	• Easy with ERASMUS partners
Defining common assessment criteria	• 1 ECTS credit = 26 hours of student work • Any other grading systems have to be converted to ECTS
Ability to share resources	• Mainly virtual courses • Access to university Moodle has to be arranged • Use of ERASMUS Mobility programme for face-to-face support if needed
Intellectual Property	
Access to state of the art technology	• The course is in Moodle – free to use • The hardware is needed where the students are located • The software is generally free for student use
Sustainability	• The course will be constantly maintained and developed
Conclusions & Recommendations	• Common assessment should be based on ECTS • No apparent major barriers to module sharing • Technology constraints may be encountered in some student localities

P4 - Moscow State University of Civil Engineering (MGSU)

Cross institutional partnerships and collaborations	MGSU international activity is the priority of the university as the national goal of export of education • MGSU: 98 partners from 34 countries, international associations • ASV: 150 HEI from 10 CIS countries
Existing inter-university joint programme and module sharing arrangements	• Joint programs with universities of Uzbekistan, Finland and Poland: • Construction • Environment protection. Water recourses • Architecture • Urban planning
Opportunities for module development, sharing and delivery in the BECK project	• Development: 3 departments of MGSU (Urban Planning; Heat, Gas Supply and Ventilation; Social, Psychological, and Legal Communications) + International Unit • Sharing: key partners of MGSU and key members of ASV in all countries • Delivery: introducing in the curricula "Urban planning", "Construction"
Language and culture	• Departments are having staff with English language skills • Programs on English are implemented. International projects are realized.
Administrative constraints	• MGSU BECK team has the administrative support of vice-rector of international activity. • Teachers have the freedom to develop curricula • Number of weeks in syllabus • Number of hours in 1 ECTS
Defining common assessment criteria	System of the assessment is to be common in BECK modules. • Equality of education • Diversity of teaching and learning strategies • Accessibility of learning materials • Sustainability of learning outcomes
Ability to share resources	• "Open Network" technical support centre • Educational online platform is to share learning materials
Intellectual Property	• The results of BECK project are to be in open access • The results of CENEAST and MAPREE Tempus projects are to be used for the development of BECK modules

Access to state of the art technology	• MGSU as the National Research University is producing new technologies • The modern technological solutions are to be implemented in the curricula • Best European and World practices are to be given attention to
Sustainability	• Complex approach of the combination of the social, economic and ecological aspects for the solution of technical issues in the modules is the key element to reach high level of sustainability • The cooperation with industry partners is the key to the sustainability
Conclusions & Recommendations	• The common approach for the development of the modules should be used in the project

P6 - University of Ruhuna (UoR) – Sri Lanka

Promoting cross institutional module sharing	Education is generally state-funded and offered free of charge at all levels, including the university level (up to B.Sc. level) in Sri Lanka. • No policies and strategic developments in state universities for module sharing. • Lack of platform to sharing resources with other universities. • The BECK project is a good approach towards module sharing, and increase the inter university collaboration in university system of Sri Lanka.
Cross institutional partnerships and collaborations	• Lack of opportunities for international students to enter the Sri Lankan universities. • Lack of Opportunities for Cross institutional partnerships and collaborations • UoR is in collaboration with many national, and international universities and agencies. • UoR established a Centre for International Affairs (CINTA) • Research collaborations, Internship for students, Industrial trainings, International symposiums are organized, collaborating with other universities at BSc level • Some module sharing opportunities are available at MSc level • Strategies, priorities and polices are highly needed to expand and develop collaborative relationships with foreign universities.

Existing inter-university joint programme and module sharing arrangements	• Inter-University joint programmes for research work and industrial training.
	  • National − Eg. with UoM, UoC, UoP, USJP
	  • International − Eg. Ryukyus University, Ibaraki University, Kobe University, (Japan).
	• - Naresuan University (Thailand), ADPC (Thailand)
	• No inter-university joint programs for module sharing
	• UoR is working towards strengthing the inter-university module sharing through BECK Project.

Opportunities for module development, sharing and delivery in the BECK project	• It's a good exposure to European education system/techniques and platforms • Greater opportunity to Sri Lanka to boost and uplift the education system with MOOCs approach. • Its valuable for resource sharing, knowledge sharing and to build inter university collaboration platform • Good opportunity to address lack of funding issues in HEIs • Introduction of new technology platform for HEIs in Sri Lanka. • Capacity building of Academic staff, Technical staff and Students • BECK project assists all universities in Sri Lanka to formulating policies on MOOCs based education • (UoR, UoC and UoM are collaboratively working towards implementing new policies on HEIs in Sri Lanka on this learning platform).
Readiness of the university for cross institutional module sharing	
Language and culture	• Official languages of Sri Lanka are Sinhala and Tamil. • However, in Sri Lankan universities the greatest number of degree programs are conducted in English language only. • There are very few numbers of courses conducted in Sinhala and Tamil languages. • English language courses help to overcome the language barriers of students who are coming from different ethnic groups.
Administrative constraints	When introducing additional courses into exiting curriculars in BSc, MSc and PhD; • Issues in accreditation procedures in Sri Lanka

	• No policies and lack of approving procedures available for MOOCs
	• Rigorous process to get approval from regulatory bodies in Intergrade this module into system
	    • Faculty Board and Faculty Curriculum Development Committee
	    • University Senate and Quality Assurance Unit
	    • University Grant Commission
	    • Ministry of Higher Education
	• Time constraints on getting approvals from regulatory bodies
	• Lack of Inter University collaboration in current context
	• Different universities across borders have different administrative setups which would depend on the political context.
	• Universities should adapt standardized administrative system for all universities.

Defining common assessment criteria	• Common assessment criteria have to be defined by relevant partner universities
	• Modules assessment criteria should be complied with institutional criteria
	• In terms of the number of credits or ECTs
	    • One academic year corresponds to 60 ECTS credits that are normally equivalent to 1500–1800 hours of total workload (1 ECTS = 25 - 30 hours)
	    • Sri Lankan credit system is defined by Sri Lankan Quality framework/ UGC
	1 credit equal to 15 hours of lectures, 30 hours of laboratory studies, 45 hours of field studies, 90 hours of industrial trainings

Ability to share resources	• There is a need of policy requirements and policy implementation to module/ resources shearing with universities • The success of a cross institutional collaboration lies on the willingness and ability to share resources • Different partnering institutions may have different level of resources; different level of expertise, access to literature, facilities, etc. and all these need to combine together to achieve a synergetic benefit. • need of technology adaptation in sharing resources on ICT based courses.
Intellectual Property	• There are intellectual property rights with authors on institution basis

	• UoR can share Intellectual Property, rights with partner organizations

Access to state of the art technology	• There are constrains on when introducing this technological improvement to current education system
	    • Lack of resources
	    • Lack of trained professionals
	    • Lack of infrastructure facilities
	    • Lack of experience in those fields
	    • Other technological requirements
	• UoR uses the Moodle environment for e-Learning facilities and used for disseminating purposes on presentations, lecture notes, assessments etc.

Sustainability	• Maintains of the shared modules after funding period? • Need alternative funding source, especially for SL universities (Due to free education policy, unable to get money from students for B.Sc. level) • A sustainable funding module should be developed. • Need continuous assessment, monitoring, maintain and updating procedures on sherd modules. • Continuous Inter university collaboration after completing project among local and international universities.
Conclusions & Recommendations	• UoR is committed to an interuniversity collaboration which encompasses developing closer cooperation with other universities. • There are many constraints on cross institutional modular development and sharing. • Sustainability plays the major role modular sharing and completing this project. • Issues and challenges associated with cross institutional platform should be addressed. • Increase of cross institutional collaboration and partnerships is highly needed.

P7 - Alma Mater Studiorum – University of Bologna (UNIBO)

Promoting cross institutional module sharing	

Cross institutional partnerships and collaborations	• The University of Bologna (UniBo) − the oldest university in Western Europe − is the most international of all Italian universities today • UniBo has recently developed a new internationalisation plan which includes strategies aimed at removing obstacles to mobility and increasing the international dimension of the institution • UniBo has an International Relations Division • In this framework, UniBo fosters the institutional participation in several European programmes, networks and initiatives on internationalisation of higher education and development cooperation
Existing inter-university joint programme and module sharing arrangements	• The existing inter-university programme is witnessed by the ongoing international projects, as well as by the visiting professors and the number of foreign students regularly enrolled at the University of Bologna (around 6.000). Another 2.000 students arrive every year on international mobility programmes (such as LLP/Erasmus, Overseas and Erasmus Mundus Action II). Moreover, the number of outgoing students on study grants is more than 2.000 per year • In addition, the University of Bologna has developed an application about innovation and digital learning: UniBO Open Knowledge (BOOK) is an initiative designed to plan and deliver Massive Open Online Courses (MOOCs)
Opportunities for module development, sharing and delivery in the BECK project	• The BECK MOOC module that will be developed by the University of Bologna could constitute a new online course within the BOOK (UniBO Open Knowledge) website • The international dimension of the University of Bologna guarantees a wide diffusion of the project, which could also become attractive for other countries
Readiness of the university for cross institutional module sharing	
Language and culture	• The UniBo BECK MOOC module will combine the international dimension of the project, the staff expertise about energy efficiency, consumer behaviour, technical aspects and architectural restoration, and heritage buildings and culture • English will be the official language

Administrative constraints	
Defining common assessment criteria	• The students of the UniBo BECK MOOC module will have to see all the lessons of the online course in order to take the final exam • Passing the final examination makes it possible to obtain a certificate of attendance
Ability to share resources	• The UniBo BECK MOOC module will provide useful materials to share the course resources (e.g. the pdf presentations of the lessons, data sheets about some case studies, a reference bibliography) • The staff will also produce publications on these issues
Intellectual Property	
Access to state of the art technology	• Starting from the skills and expertise of the University of Bologna staff that is involved in the project, the access to state-of-the-art technology will be carried out through bibliographical and regulatory researches
Sustainability	• Archival researches and operational surveys will implement the bibliographical and regulatory researches in order to produce a BECK MOOC module on the themes of sustainability, by conjugating energy efficiency, consumer behaviour, climate change and heritage buildings
Conclusions & Recommendations	• The specifications about the UniBo MOOC module will be presented in the following presentation • In the meantime, UniBo staff is organising the Italian meeting on November 2019

P11 - Patuakhali Science and Technology University (PSTU)

Promoting cross institutional module sharing	• No doubt, Bangladesh is one of the most vulnerable countries to climate change in the world. • In one hand, over/inefficient energy consumption leads to climate change and on the other hand, climate change has several negative impacts on energy sector, particularly in Bangladesh. • Hence, it is high time to take initiatives for savings energy for future generation through changing consumer behavior by incorporating energy efficiency and climate change in course
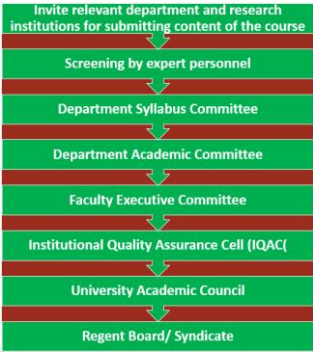
	curriculum at primary, secondary and tertiary level of education.
	• And still we are at initial stage in this regard.
	• The government of Bangladesh is ready to go with all kinds of online education in the country at every level of education by policy initiatives and practical physical supports.
	• But the education sector is not fully ready, although a few e-learning initiatives at a small scale are found at the lower level of the education system.
	• The tertiary level institutions still rely fully on the conventional system of providing education, with the exception of Bangladesh Open University (BOU) which has developed necessary infrastructures for e-Learning.
	• However, in terms of MOOC, only one university, Bangabandhu Sheikh Mujibur Rahman Digital University (BDU) has started MOOC on "Digital Learning Design" this year (2019) in the country.
	• The encouraging fact is that the government has undertaken various initiatives for making the people technology-aware and developing country-wide internet connectivity.
	• But, still lacks in cross institutional module sharing approach.
	• We wish, Patuakhali Science and Technology University and Barishal University will be the pioneer in cross institutional module sharing in Bangladesh.
Cross institutional partnerships and collaborations	▪ By the Parliamentary Act no. 38 of 2001 and APA with government, PSTU is bound to generate and disseminate knowledge.
	▪ PSTU already made **MOUs** with the following universities and institutes *to enhance and exchange Quality Higher Education and Research*.
	• Boda University, Norway
	• Hohenheim University, Germany
	• University of Salford, UK
	• University of Copenhagen, Denmark
	• University of Canberra, Australia
	• Kyungpook National University South Korea
	• Sunchon National University, South Korea
	• North Eastern Hill University, India
Existing inter-university joint programme and module sharing arrangements	• Not exist
	• But, PSTU is going to take initiatives starting such joint programme and module sharing approach through BECK centre

Opportunities for module development, sharing and delivery in the BECK project	• None of our university resource personnel/teachers have participate in preparing MOOC modules. Hence, it will be a **challenge** in preparing quality MOOC modules for us. • But, we have experience in quality assurance by Institutional Quality Assurance Cell (IQAC) and we have resource personnel who are able to design and ensure quality curriculum in line with Padagogy and/or Andragogy. • In addition, our few resource persons/teachers prepared different **training modules** that knowledge will help us in this regard. • Moreover, appropriate **training** will be necessary for ensuring quality MOOC. • We do not have any obligation to prepare, share and delivery MOOC modules to the BECK Project (as we made agreement with BECK). • MOOC is new area for PSTU. We believe, PSTU will be benefited from BECK project in preparing and sharing MOOC modules.
Readiness of the university for cross institutional module sharing	▪ Mentally, PSTU is ready to do MOOC and PSTU authority assure us that they will assist and cooperate the project. ▪ We have virtual class room, cyber center, geo-information science and earth observation lab along with high speed internet facility to carry out the cross institutional module sharing. ▪ In addition, PSTU has experience in directing e-learning during 2008-2012 with the help of CDMP, Bangladesh.
Language and culture	*Language* • There is a nexus between **language and learning**. • Educational requirements and language vary from country to country. Hence, preparing common module is always a challenge. • Our most of the higher education students are supposed to complete their graduation with the **medium** of instruction in **English.** • But our thinking is, we can produce MOOCs in **multi-language including English, Russian, Bangla etc.** *Culture* • In Bangladesh, most of the students prefer **class room, laboratory and field (community) learning**. • However, our few institutions /organizations (Muktopaath, 10 Minute School, Virtual Skills Development System-VSDS, Shikkhok.com, Shikkhok Batayan , Kishor Batayan) and one

	university (Bangladesh Open University) have started **e-learning and distance learning** few years back. • But MOOC approach has adopted in this year (2019) by Bangabandhu Sheikh Mujibur Rahman Digital University. The university has been established **to promote online, distance and virtual learning** in Bangladesh. • However, our new generation is much more advance in ICT and they would prefer **MOOC approach**.
Administrative constraints	▪ Administrative procedure of MOOC approval will take at least 6 months. ▪ **Accreditation** hierarchy → ▪ In addition, we have only one virtual classroom. The number should be at least three.
Defining common assessment criteria	**PSTU usually follow two types of assessment** (i) Formative assessment (30%): Short answer, Quiz test, Presentation, Assignment, Group/field work, Project (ii) Summative assessment (70%): Final Exam (written) **Need to talk about common assessment criteria**
Ability to share resources	**PSTU is able to share the resources through -** • Its website and social media pages • Arranging seminar, symposium and awareness meeting • Circulation in print and electronic media • Arranging motivation/ debating competition • Press briefing / meeting • University Journal, bulletin, brochure and prospectus • Talk-show in mass media (TV and Radio)
Intellectual Property	• PSTU is flexible on sharing knowledge among universities, institutions, communities and researchers but patent should be to the participating universities.
Access to state of the art technology	• **PSTU has a-** • Modern Virtual Class (VC) room

	• Cyber center • Geo-information science and earth observation lab • Lab has smart board/ multi-media projector and internet facility • All class rooms have audio-visual facility

Sustainability	• Sustainability of MOOCs will depend on its contents. Hence, all MOOCs should be **demand driven/ practical**.
	• Also depends on:
	   • **Technical supports**
	   • Determination of the university supported by **budget facility**
	• We need to formulate easy strategy **to revise/ update** the module as and when needed.

Conclusions & Recommendations	• MOOC approach in higher education institutes (university) is new in Bangladesh. • We need assistance from BECK centre establishing MOOCs in PSTU. • PSTU will be benefited by preparing modules and establishing MOOCs. • But we need to give more focus on the sustainability issues of the MOOCs. • Better to have some specialized personnel to work together who have past and enough experience in this approach.

P12 - University of Colombo, Sri Lanka (UoC)

Promoting cross institutional module sharing	

Cross institutional partnerships and collaborations	• The Department of Sociology has established collaborations with many international and national universities. These include: University of Ljubljana, Slovenia; Durham University, UK; Deakin University, Australia and the Northern Kentucky University (NKU), USA
	• In addition, the department collaborates with many national ministries, departments and institutions to
	   • Provide field training for undergraduates,
	   • Provide practical placements for students undertaking a field-based course component particularly within the social work study stream (Urban Development Authority, Ministry of Social Empowerment and

	Welfare, Alcohol and Drug Information Center, and various healthcare providers as well as institutions for patients with mental disorders), and • Provide internships for Honours Degree students in the third year.
Existing inter-university joint programme and module sharing arrangements	• At the moment, the university cater to a few joint programmes such as the international student exchange programme with the Justus Liebig University (JLU), Giessen, Germany for students specializing in English. • However, the department has not ventured into module sharing arrangements with other local and foreign universities.
Opportunities for module development, sharing and delivery in the BECK project	• New knowledge, expertise and training • Platforms for module development • Funding prioritizing the different facets of consumer behaviour relevant to energy efficiency and climate change • Academic opportunities and awareness building • Training and pedagogic practice in integrated education on consumer behaviour relevant to energy efficiency and climate change
Readiness of the university for cross institutional module sharing	
Language and culture	• In the University of Colombo, mediums of instruction are from Sinhala, Tamil and English. • The undergraduates are exposed to both traditional and blended learning, especially through Learning Management Systems. In some cases, courses are completed on a fully online basis through the Virtual Center of the university.
Administrative constraints	• Approval and accreditation to offer courses on the topic from tertiary educational bodies and committees within the university and the University Grants Commission, in accordance to the Sri Lankan Quality Framework (SLQF) • Lack of Clear university rules and regulations to offer courses to all internal and external students • Costs attached to offering and maintaining the course • Online Platforms to offer the programme • Technical knowledge for organization of MOOCs

Defining common assessment criteria	• The prevailing assessment criterion in the university is continuous assessments and final examination or report. • However, this has to comply with the SLQF framework
Ability to share resources	• In a situation where the courses/ modules are shared, the university lacks rules and regulations on which to operate as previous attempts have not been made
Intellectual Property	• Lack of clear university rules and regulations for intellectual property rights of the courses developed by the consortium
Access to state of the art technology	• Lack of online platforms (The virtual campus of the university merely coordinates programmes and does not have the online platforms to run the programmes) • Lack of technical knowledge and expertise • Lack of modern, up to date resources
Sustainability	
Conclusions & Recommendations	• It is mandatory to comply with rules and regulations with the university, higher education authorities including the UGC and Higher Education ministry • A lot of time can be spent on establishing the legal frameworks on which the modules can be developed • A lot of expertise and training is required to provide MOOCs

P13 - Barisal University (BU)

Promoting cross institutional module sharing	• Bangladesh is one of the most vulnerable country to climate change in the world. • Education sector in Bangladesh is not sufficiently organized and formatted to combat energy and climate. • However, universities in Bangladesh faces high level educational and research in relation to energy efficiency and climate change. • University graduates have lack of Multidisciplinary integrating education and syllabus at higher education (HE) in Bangladesh. • Also, communication between universities and stockholders is insufficient to meet the challenges. • Therefore, to increase the capacity of the HE, needs modernize and enhance the quality of the education. • Still we are at initial stage in this regard. • The government of Bangladesh is taking initiatives for e-learning education system.

	• HEI's at Bangladesh having lacks in cross institutional module sharing approach. • Barisal University and Patuakhali Science and Technology University will be the pioneer in cross institutional module sharing in Bangladesh.
Cross institutional partnerships and collaborations	• Higher education plays an important role in shaping the capacity of the work force and in fostering research and innovative thinking (ADB, 2012). • Education at HE is changing dramatically due to globalization, role of private sector, international ranking of the university and students demands and expectation. • Therefore, importance of collaboration and partnerships in the higher education sector has widely been recognized. • Partnerships are increasingly becoming important in the current context. Partnerships have become common in the field of academic for various reasons (Amey et al., 2007). • Barisal University (BU) has partnership and collaboration with one UK university and has few collaborations with national organization. • However, there is no partnership or agreement for faculty development, accreditation, harmonization of curricula, operating regulation and module sharing.
Existing inter-university joint programme and module sharing arrangements	• At present BU has no inter-university joint program and module sharing arrangements. • However, BU is taking initiatives to enhance the opportunities for inter-university joint program.
Opportunities for module development, sharing and delivery in the BECK project	• As a result, development of comprehensive teaching and learning materials and incorporating innovative teaching and learning methods has become an issue in Barisal University. • Therefore, BU will be benefited from cross institutional knowledge sharing on module development. • BU would be able to and promote lifelong learning at large within the society by making study material accessible outside traditional classroom environment to various parties within the society from students, teachers to practitioners and policy makers. • None of our university resource personnel/teachers have participate in preparing MOOC modules. Hence, it will be a **challenge** in preparing quality MOOC modules for us. • T**raining** will be necessary for ensuring quality MOOC.

	• We are free to prepare, share and delivery MOOC modules to the BECK Project according to Barisal University (BU) rules and mutual agreement for the BECK project. • BU will be benefited from BECK project in preparing and sharing MOOC modules.
Readiness of the university for cross institutional module sharing	• In a collaborative partnership it is of paramount importance to have a clear idea on the skills, interest and capabilities of the staff engaged in the other institutions. • These need to be coupled with effective communication channels which indeed require use of Information and Communication Technology (ICT). • With the latest development in ICT, many channels are available for cross border collaboration and knowledge sharing. • BU has unlimited high-speed internet facilities. Therefore, BU has sufficient ICT to adapt latest technology to succeed cross institutional module sharing. • BU would be able to provide virtual campus, open educational resources with the aid of high-speed internet connection. • BU ICT is good enough to facilitate cross institutional module sharing. • Thus, BU is ready to adapt latest technology to succeed in cross border collaboration.
Language and culture	*Language* • There are some issues and challenges related to cross institutional module development. • Defining a common module is not always easy. Based on the geographic location, climatic conditions, economic climate, supply and demand of education sector vary from one country to another. • Language and culture are major hindrance to cross border partnerships. • BU students would prefer face to face learning as well as distance learning. • With the development of ICT, the new generation of students of BU has techno-cultural skills comparable to reading and writing and may prefer internet-based learning activities.
Administrative constraints	▪ Administrative issues are also one of the major barriers in cross institutional module sharing.

	- BU administration have very flexible governance arrangements which would help in the development and delivery of shared modules. - To approve the MOOC course in BU, need to go through few academic and administrative procedure as follows. - First to submit primary course content. - Screening by academic committee with external expert. - Final approval from academic council
Defining common assessment criteria	**BU usually follow two types of assessment** (i) Formative assessment (40%): Short answer, Quiz test, Presentation, Assignment, class attendance and performance (ii) Summative assessment (60%): Final Exam (written).
Ability to share resources	- Another important factor is the ability to share resources. BU has technology advantages in sharing module resources. - Its website and social media pages - Arranging seminar, symposium and awareness meeting - Circulation in print and electronic media - Arranging motivation/ debating competition - Press briefing / meeting - University Journal, bulletin, brochure and prospectus - Talk-show in mass media (TV and Radio)
Intellectual Property	- Intellectual Property law generally changes from one country to another (Burgi, 2009). - Different institutions may have different licensing models and as a result when sharing resources it is very important to have a prior understanding on how these different laws would apply for different study materials. - BU administration is flexible on sharing knowledge among different institution and community. Therefore, BU laws would be flexible for different study materials according to the needs.
Access to state of the art technology	- State of art technology is an important element in cross border partnerships. - ICT based teaching and learning now become an integral part of BU education systems. - BU would collaborate effectively with partner universities.
Sustainability	- It is also very important to have a clear sustainability plan which identifies how the collaboration would sustain beyond the life of the project. - As a result, it is very important to define protocols on how the modules could be amended/ changed, how to deal with

	copyright issues and so on in order to ensure smooth evolution of the module delivery. • BU would cooperate BECK partner universities regarding collaboration to have clear sustainability plan.
Conclusions & Recommendations	• MOOC approach in higher education institutes (university) is new in Bangladesh. • No major barriers to module approval, delivery and sharing at BU.

P14 - University of Moratuwa, Sri Lanka (UoM)

Promoting cross institutional module sharing	

Cross institutional partnerships and collaborations	• There are 15 state funded universities under UGC
	• Out of which 06 universities offer Engineering degrees
	• These institutes run as semi-autonomous bodies
	• Student admission is through the UGC and the course is mainly developed by the institute
	• NO content sharing
	• Research
	  • Undergraduate -YES
	  • Postgraduate -JOINT SUPERVISION (degree offered by a single university)

Existing inter-university joint programme and module sharing arrangements	• Collaboration among;
	• Undergraduate
	  • University level NO
	  • Interfaculty YES
	• Postgraduate
	  • University level NO
	  • Interfaculty YES
	  • Cross supervision YES (degree offered by a single university)

Opportunities for module development, sharing and delivery in the BECK project	• Content can be developed jointly • Delivery should be subjected to respective faculty board approvals • NO credit transfer is possible • Only contents can be shared with unique subject codes and names

Readiness of the university for cross institutional module sharing	
Language and culture	- There are 6 main streams in SL higher education - Science, Mathematical and Technology streams are totally delivered in English - Students are mainly thought in Sinhala up to their Advance level at schools - And are with different socio-cultural adaptations - Exposure to IT related skills and Social networking is vastly vary with respect to their inherent cultural aspects - Students are mainly trained on content-based education and they are poorly adopted to self-learning and teaching
Administrative constraints	- Any addition/deletion needs faculty and then senate approval - The rationale of any course will be ratified by respective University/Industry Consultative Boards (UICB) at regular intervals - Content and the delivery will be overseen by international accreditation bodies and should comply with their observations
Defining common assessment criteria	- Subject outcomes are fixed and need to assess them through the subject delivery - Total evaluation can be 100-0% continuous assessment or 0-100% end semester exam - This criterion should be fixed and cannot be altered - Mode of assessment can be changed based on their effectiveness - Hence, assessment criteria should be fixed at the beginning, however, the mode of assessment can be changed
Ability to share resources	- Online resource sharing is possible - Sharing resources between universities – Possible - Responsibility of the content should bare by the respective lecturer - Should be delivered as a course which owns by the respective university/faculty/ department
Intellectual Property	- IP rights are mainly governed by the Establishment code of the state services - In addition, UGC as its own guidelines on IP rights

	• Respective universities to have their own IP policies and an IPac committee
Access to state of the art technology	• Runs with limited resources • Restrictions in bandwidth limits the access to online resources • Limitation of availability of internet facilities – Student/staff • Outdated software and hardware • Poor knowhow on ICT
Sustainability	• Poor connectivity • Sudden changes in policies/systems • Interference –faculty/own staff/ industry
Conclusions & Recommendations	• There are cross socio-cultural aspects, which govern the success • Poor facilities and ICT knowhow will be a barrier • changing attitudes of teacher centered education will be a huge challenge • None availability of CPD for staff will weaken the system • Stick to a common structure and maintain the continuity • Get relevant approvals ontime • Urge institutes to strengthen their ICT facilities • Do regular training –In-house/online • Maintain a user manual and send regular updates • Make sure the contents are up to date and update timely • If possible, run a manual system partially until the system is fully geared to online

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