



African Clean Energy Research Alliance (ACERA)

Consortium training

Held at

Makerere University Bamboo house

26-30th April 2018

Organized by

Centre for Research in Energy and Energy Conservation

College of Engineering, Design, Art and Technology

Makerere University, Kampala, Uganda

Compiled by:

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PhD-Student-ACERA Program





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1.0 Introduction

African Clean Energy Research Alliance (ACERA) was awarded a 5-year grant in May 2016 under Programme Round 2 of The Royal Society's Africa Capacity Building Initiative (ACBI). The main goal of this initiative is to increase and strengthen the research capacity of universities and research institutes in Sub-Saharan Africa by supporting the development of sustainable research networks. The ACERA consortium consisting of University of Leeds (UK), Université Marien Ngouabi (Republic of Congo), Dar es Salaam Institute of Technology (Tanzania), Makerere University (Uganda) and CREEC (Uganda). The just concluded training entitled "holistic approaches in renewable energy project management" is part of the capacity build initiatives, scheduled within the ACERA program, to cover technical, entrepreneurial and dissemination modules.

The four days training was divided into two, with the first two days for ACERA internal meeting. Tour of CREEC & CEDAT research facilities were carried out, project progress in all the three Consortium University were discussed and evaluated. Financial and administrative issues discussed and commitments reaffirmed.

The last two days were opened to the invited audience in accordance with the objectives of the consortium. The discussions and actions points from the training workshop has been organized under two section of:-

- A. The Consortium Meeting program
- B. The stakeholder training program and participants





1.2 The consortium meeting

This is an internal ACERA meeting that always brings together the main project implementers (PI), the Co-project implementers, the students' supervisors, the PhD students and any other project coordinators. For this particular meeting, the following were the programs and issues discussed.

Day 1: Tuesday 24/04/2018 Arrival and tour of research facilities

- The main activity on this day was receiving of the guests especially from UK (Refer to Annex 1). The guests were then ushered into a tour of Makerere University College of Engineering, Design, Art and Technology (CEDAT) analytical and thermodynamics labs where Opio Miria, the PhD student carries out his research experiment. Thereafter, they were also shown the CREEC's test facilities which included: Solar lab and Bioenergy lab.

Action points.

- i. Dr. Andrew Ross, one of the PI and PhD student advisory from the University of Leeds, noted with concerned the lack of major equipment for analytical analysis and promised to liaise with University of Leeds to see if there are second hands equipment that can be shipped to Makerere University
- ii. Dr. Andrew Ross also showed great interest for collaboration with Makerere University especially in the area of engine combustion and emission testing, given that there are already some facility existing on the ground.

Day 2: Wed 25/04/2018 PhD research progress and administrative matters

This meeting was chaired by Mary Suzan Aboo, Co-PI and director of CREEC, who welcomed the rest of the consortium PIs, the visiting scholars and the PhD students. Round table introductions were then made as per the details in Annex (A.1). This was followed by the PhD progress presentations as follows:-

PhD students' presentation

The three Ph.D. students provided an engaging presentation on three topics derived from the title of the main project: Solar treatment of biomass for power generation using carbon slurries in hybrid renewable energy systems.



i. Mayala Tania (PhD student), Université Marien NGouabi, Brazzaville, Congo.

Research Topic: Development of solar-driven thermochemical processes

Tania's presentation highlighted the integration of Solar thermal heating technology with thermal chemical biomass conversion routes such as pyrolysis, gasification and hydrothermal conversion which represent an innovative solution for biomass processing in the regions with large solar flux. The student also identified the potential of the project as it can be scaled-up by the concentration of the solar energy on a large-scale using the different existing optical configurations such as trough, tower and dish system parabolic reflectors. From where the concentrated solar can then be directed using optic bundles to solar hoods that irradiates the reactor directly. The presentation also provided a local context that underscored the complexity and interconnectedness of the marine ecosystem and energy needs to be given that the feedstock identified (Algae and *Ledermannia*) are mainly available on large scale from Congo River.

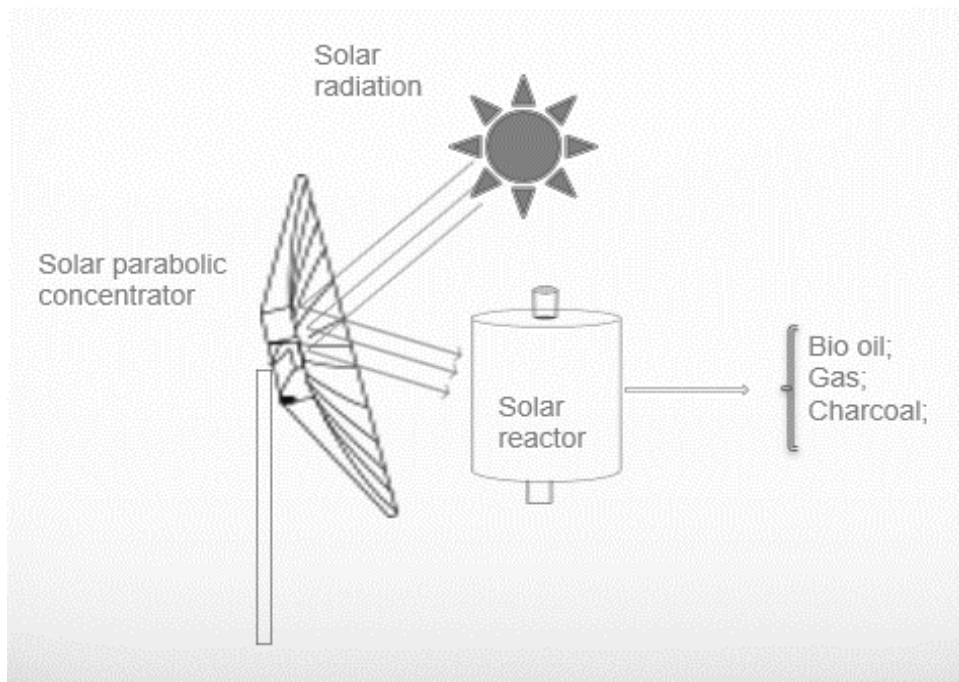


Figure 1: The project lay out

The student so far has completed the following



ii. Opio Innocent miria (PhD student), Makerere University, Uganda

Mr. Opio followed, by demonstrating how to explore the biochar obtained from Tania's experiment to formulate biochar slurries as a novel biofuel for power generation in developing countries. He identified the key challenge to achieving this as the insufficient knowledge about the characteristic of parameters required for ternary blends of solids loadings for low viscosity has been identified as one of the obstacles. As well as limited demonstration whether it can work or not especially in medium to high-speed engines.

The presentation was broken into three specific parts. The first part identifies the biomass feedstocks/species suitable for the biochar production. The second objective highlighted several processes that transform the biochar into suitable sizes for char slurry formulation. The third part focused on how to create char slurry fuels that can effectively be handled by the engine and are stable, during storage, combustion and the power characteristics from the engine. The research direction was summarized in figure

2



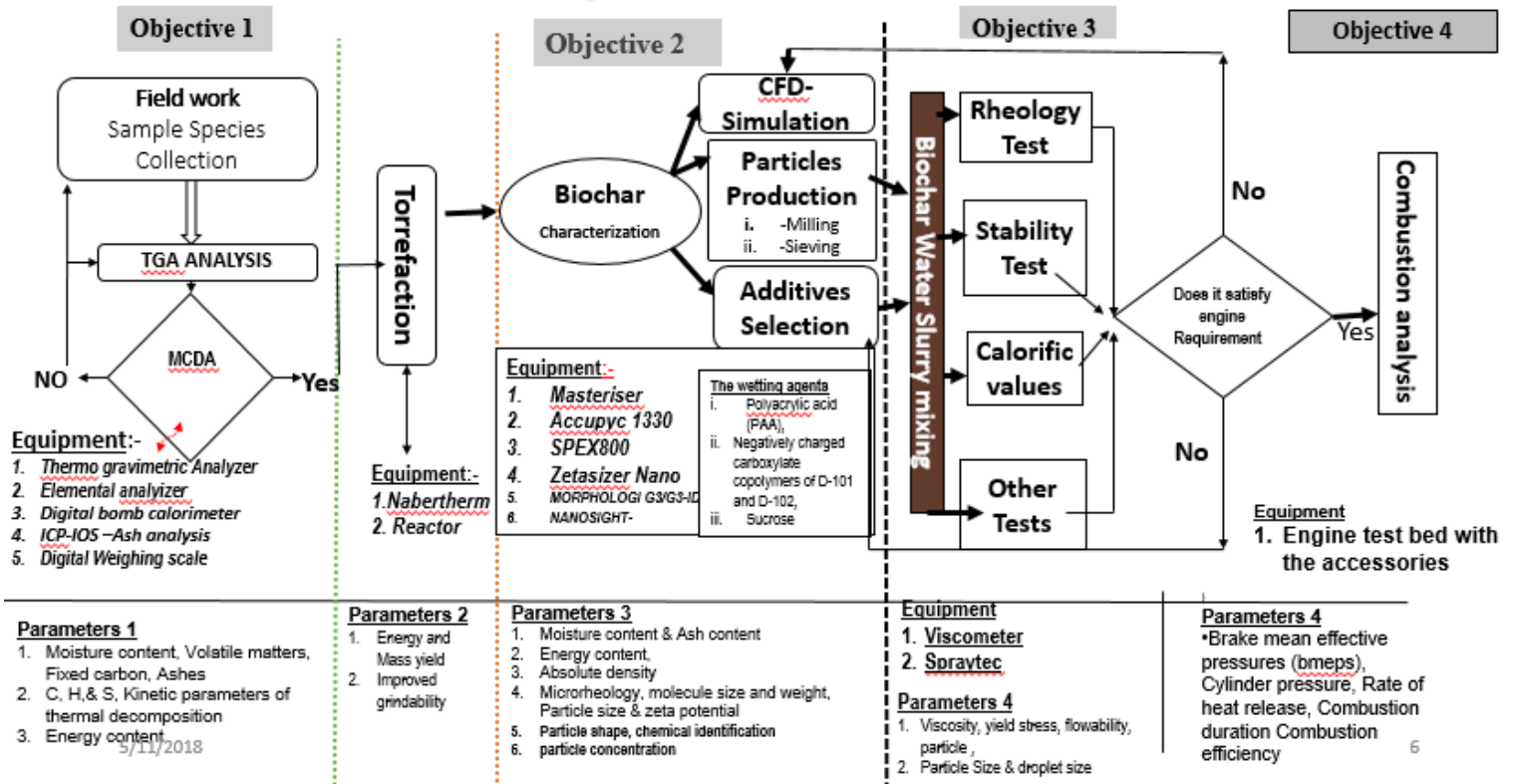


Figure 2: Experimental Set up

As per the experimental methodology figure 2, upto 90% of objective one has been accomplished. However the student attributed the delay to the lack of precision analytical equipment at Makerere University. Arrangement are being made for the objectives two to be accomplished at University of Leeds from June 2018 with the help of Dr. Andrew Ross.

iii. Mwaka Juma, PhD student from Dar es salaam Institute of Technology, Tanzania

Mwaka then provided an overview of how electricity produced by Opio using the carbon slurry and other sources like solar, micro hydro power etc can then be modified in to a suitable form for supply to the consumers. Mwaka elaborated more through her specific objectives (1) to develop a model representing a single line of hybrid renewable energy sources, (2) to develop a control algorithm for scalable hybrid renewable energy facility, (3) to evaluate the performance of the scalable hybrid renewable energy facility through simulation and (4), to build and test a prototype for experimental verification of the scalable hybrid renewable energy facility. The general concept is as illustrated in figure 3.



Proposed Scalable Hybrid Renewable Energy System

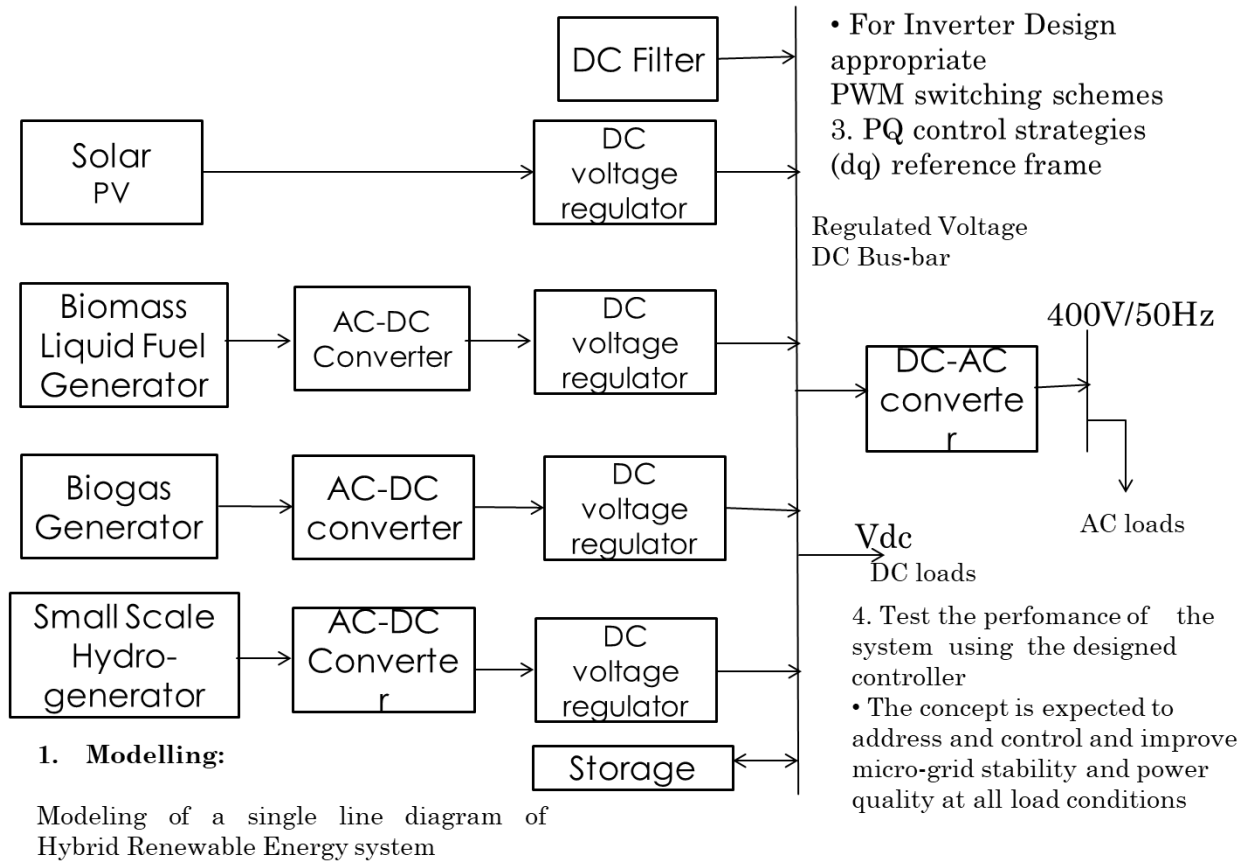


Figure 3: Scalable hybrid renewable integration technology

The students' presentations prompted a discussion ranging from the content, research direction, time line and budget with notable action points as follows:



1.3 Comments on students' presentation.

i. By Prof Jon Lovett: PI

Prof Jon Lovett who is the main PI, recognized the effort of each consortium PIs and students in the implementation of the action agenda, and imperatively emphasized the goal of the project which is the capacity building. According to professor:

- Opio Miria should organize workshop for the technocrats in the field of Botany, Ecology, and natural resource, to justify the reason for choosing agricultural residues, indigenous and imported species while considering the aspect of environment, social and economic sustainability.
- Meanwhile, other forms of slurry application should be investigated
- Tania Mayala experimental setup should expand the choices of the feedstocks to include the non-aquatic biomass
- Mwaka Juma project should point out her original contribution to the PhD come clearly to demonstrate if there will be a physical prototype or use of models only

Above all, Prof Jon encouraged each PhD student to focus on writing journal papers early enough from each objectives

ii. By Dr Andrew Ross: Advised:-

Tania

- To consider using the Concentrated Solar Power to generate steam which can be easily and uniformly distributed in the jack of the reactor for the thermal chemical conversion process.

Opio

- To expand the project by looking into the use of blending bio-oil derived from the biomass using pyrolysis process for blending with diesel or bio oil with the biochar. The proposed to be procured should be big enough.
- Multiple engine choices should be considered, especially those old technology that can tolerate or use dirty fuels.
- Samples to University of Leeds for complex lab test and analysis
- Predictive modelling using CFD with the results feeding into objective two



Mwaka

The PhD student was advised to ensure that all the three topics link together

iii. By Prof Mackay

- Professor advised especially Opio to link to private sector on the issues of multi-use of trees. Documentations of all research steps was highly emphasized.
- Meanwhile Dr Betty suggested to know from the University of Leeds experiences on ways of improving the engine performance

1.3.1 General comments

Apart from the individually directed suggestion and advises, there were also general comments which include:-

- Dr Ross also highlighted that laboratory at University of Leeds can only be accessed through the current students from University of Leeds. The access is limited to Analytical laboratory
- Any visit to University of Leeds for more than a month will require payment of bench fees, hence planned visits should be broken into short durations not exceeding a month.
- Information regarding the test should be sent to University of Leeds team in advance detailing the kind of test required. University of Leeds maintain high safety culture, hence all samples must be sterilized
- Mechanism to assess the progress should be put in places, for example Skypes call every 4 weeks, setting up of blogs by the students
- Dr. Ross also suggested need for procurement of essential equipment such as:
 - Gas chromatography
 - Atomic absorption spectrometer
 - Other second hands analytical equipment instead of spending all the money on expensive brand new equipment.
- In other discussion during the ACERA meetings, Dr. Sian Evans also made presentation on financial management section 2.3 as a learning tool for all the ACERA team to get acquainted with during this project.



- Diane Myers, a documentary expert showed great interest in carrying out documentary on each of the activities within the renewable project and package it in a form that can be shared across networks. Several visits were organized for her to capture the story telling by renewable energy beneficiaries of projects done by CREECS such as a visits to Watoto homes, Sambiya babies home, St Theresa primary School.
- Professor Jon also introduced the newly won project titled “Creating Resilient Sustainable Micro grids through Hybrid Renewable Energy Systems”, funded by the EPSRC that will see part of the ACERA team get involved

2.0 The renewable energy projects management training

2.1 Opening the training program

By Mary Suzan Abb, CREEC Makerere

Mary Suzan Abbo, who was the host and managing Director of CREEC opened the training with a presentation that provided an overview of the CREEC operations and aspirations and its relationship to the current ACERA training with the following key points.

- The Centre focuses on the thematic areas of rural electrification, energy for productive use, household energy and energy entrepreneurship with energy management as a cross-cutting theme.
- The Centre aims at application and adaptation of technologies to the specific Ugandan and local environment with an emphasis on systems with components that can be locally manufactured. For capacity building and knowledge transfer purposes, CREEC endeavors to include students in the Centre’s projects whenever possible.
- The Centre focuses on thematic areas of: rural electrification, energy for productive use, energy efficiency, energy for household use, energy testing services and energy entrepreneurship under the two departments: Project engineering and Testing Services. CREEC also carries out activities in different renewable energy technologies including:- Bioenergy, Biogas, Briquette making, Gasification, Improved Cook stoves, Solar PV, Pico Hydro, Energy management and Other
- CREEC-Makerere University (Uganda) is one of the four members of the ACERA consortium implementing the Royal Society/DFID funded projects.





2.2 Managing for Impact, the DFID funded project

By Prof Jon Lovett (University of Leeds)

This presentation explored the core reasons why the project was initiated and being funded by the Royal Society and DfID. Among the many reason, the following were at the core areas of the discussion

- Contribution towards universal access to affordable modern clean energy
- Banishing of indoor air pollution
- Avoid gender discrimination
- Empower enterprise establishment

Hence ACERA project activities are geared towards, Building capacity, developing a platform of expertise, assembling a network, of researchers, technicians, practitioners, policy makers as well as under taking the current research in solar pyrolysis of biomass for slurry engine in a bid to demonstrate a hybrid grid that supports those core reasons. In that regards ACERA has partnered with other institutions including

- Centre for Research in Energy and Energy Conservation (CREEC), Makerere University, Uganda.
- Université Marien NGouabi, Congo Brazzaville.
- Dar es Salaam Institute for Technology and University of Dar es Salaam, Tanzania.
- University of Leeds, UK.

To achieve the stated reason, ACERA is also in the process of building platform, under a new project of “Creating Resilient Sustainable Micro-Grids through Hybrid Renewable Energy Systems” being funded by Engineering and Physical sciences Research Council (EPSRC)-UK. This project will see development of mini-grids that can reach up to 4000 people.

The resilience development initiative, has brought in new partnership including the Bandung Indonesia, ‘Ionic Islands’. Case Study Sumba Island., Advisory board from: Mexico, India and Malaysia as well as other global network.

The ACERA looks forward to the forth coming renewable energy project management by applying a simple model as illustrated in figure 4.

To create achieve the impact, the consortium will continue to implement

- Stakeholder Engagement and Knowledge Transfer
- Building advisory Board and Global Network





- Reaching out to Policy makers, businesses, communities
- Expansion of learning environment through Massive Open Online Course (MOOC), other public engagement and dissemination such Policy briefs, Press releases, Website and International conferences among others.

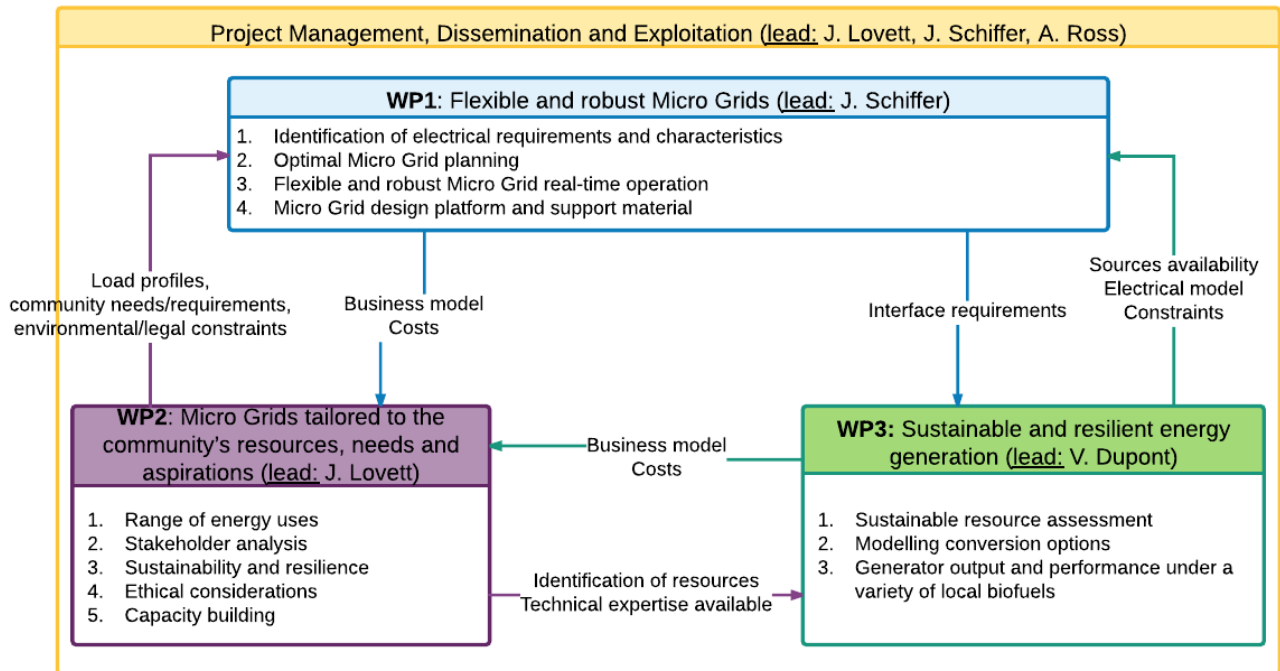


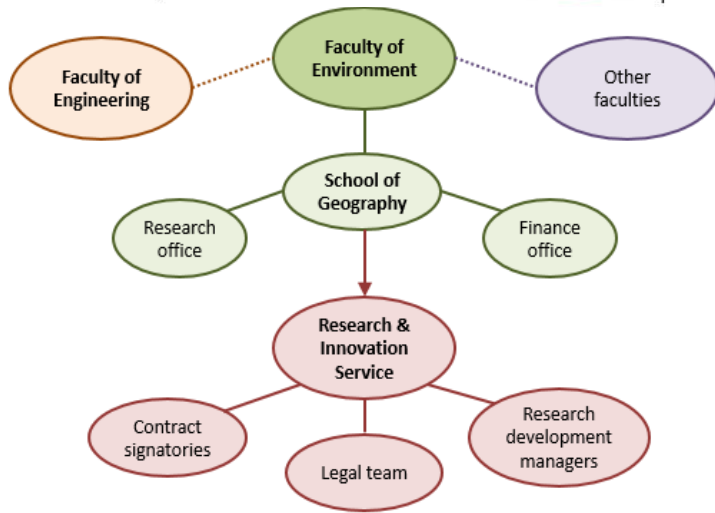
Figure 4: Proposed project management models

This presentation ushered into how research and innovation is being supported with a case study of University of Leeds as in the next section.

2.3 Research and Innovation Support-

By Dr Sien Evans, University of Leeds

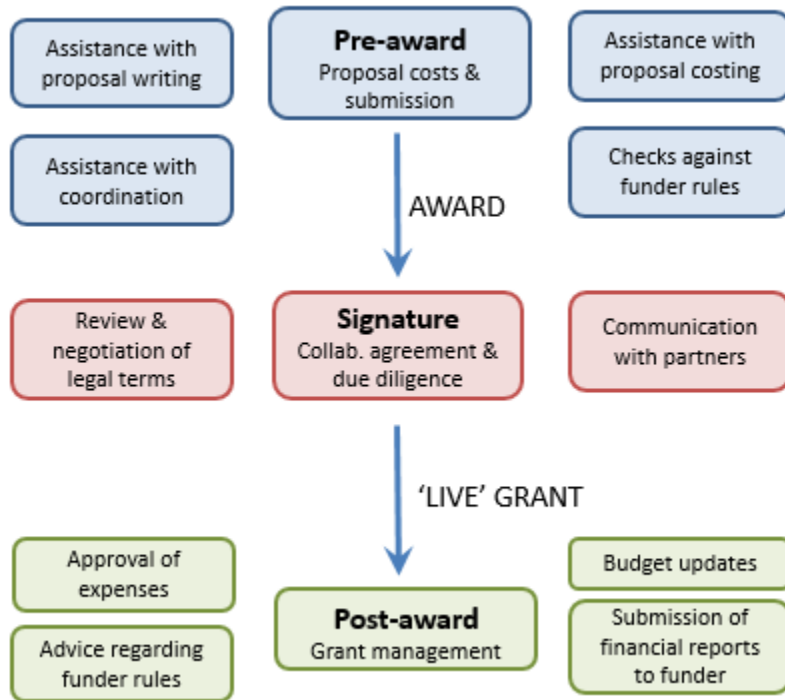
i. Research coordination structure



This is an illustration of how the different departments at university of Leeds are connect and the research activities are coordinated

Figure 5: University of Leeds Research coordination structure

ii. The Research support process

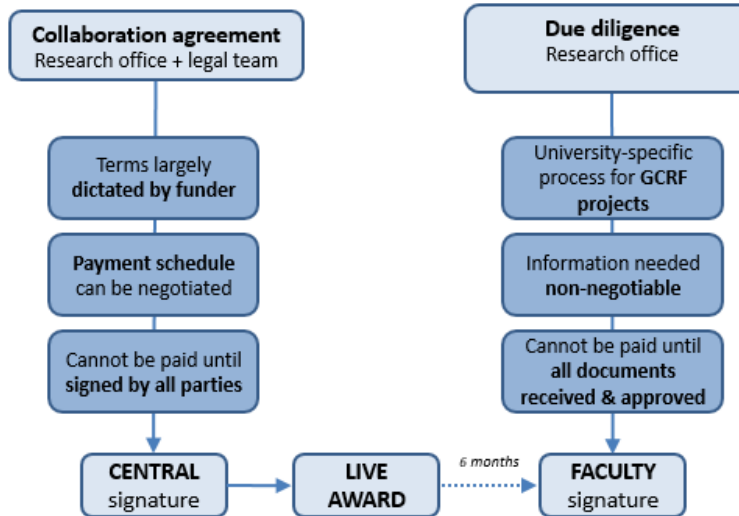


Two separate claim processes – their own internal (should follow own guidelines)
Can self-receipt if not possible from vendor (but not everything)

Figure 6 Research support process



iii. Project administration – award stage



Paperwork in English – RCUK, not university

Advance payments possible – details

Due diligence – periodic reviews throughout grant.

iv. Project administration – post-award

Day to day costs

- Follow your own institutions' expenses policy (e.g., any daily caps on accommodation, etc.)

Salaries	Students	Travel
<ul style="list-style-type: none"> Employment contract of anyone's salary who is paid by the grant Details of payment made 	<ul style="list-style-type: none"> Contract between student and institution Split between fees and stipend Details of payment made to student 	<ul style="list-style-type: none"> Receipts for all items claimed Claim form, or similar, detailing costs & purpose Evidence of exchange rate where costs incurred in foreign currency

- Two separate claim processes – Each organization can follow own guidelines
- No expenditure incurred beyond end of grant, can't purchase during grant for travel that will take place after
- But can travel in last weeks, and submit within 6 weeks of end of grant
- Economy travel, NOT premium economy for flights - contact post if unsure





v. Sample of Expense forms at University of Leeds

CLAIM NO: 0001

EXPENSE FORM

Name of claimant]

DATE SUBMITTED: xx/xx/xxxx PERSONNEL NO: xxxxxxxx

DEPARTMENT: TRAVEL/NON-TRAVEL: Travel & Subsistence

DEPARTURE [Location] DESTINATION: [Location]

DATE FROM: xx/xx/xxxx DATE TO: xx/xx/xxxx

Grant number: _____

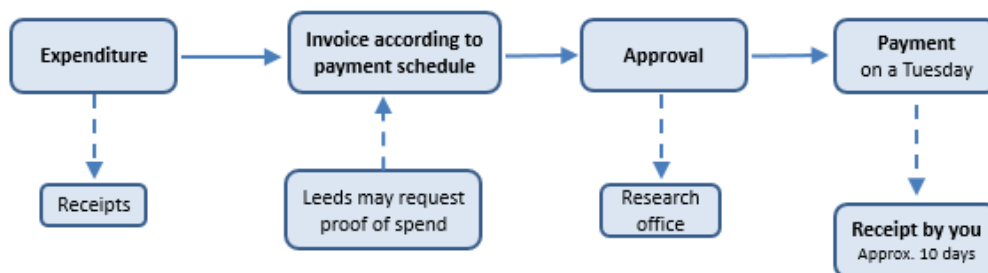
Purpose of Claim
[Reason for travel/expense]

Receipt information

Expense Type	Amount (GBP)
E.g., Accommodation, 1 night	100.00
E.g., Lunch	10.00
E.g., Evening meal	20.00
Sum of Receipts	130.00

vi. Project administration – post-award

Periodic claim



If invoice OK and no queries, 3 weeks is reasonable timescale for receipt of invoice at Leeds to receipt of payment by overseas institution

10 days completely external – international banking, no control

Payment in GBP not USD or other

vii. Required Due diligence

Other activities involved in the due diligences which include

- Main project contacts – including admin
- Organisational details
- E.g., legal status & corporate governance





- Finances & accounts
- Research grant management – policies & procedures
- Contracts
- Insurance
- Conflict of interest
- Document checklist

2.4 Research Management- a case of study at University of Leeds

By Dr Andrew Ross.

- At University of Leeds, PhD Supervisors are often world leading experts in a particular focus. They work collaboratively with range of stakeholders and other academics in other disciplines. Normally they have experience and track record obtaining external funding and publication or research.
- Within physical sciences and engineering, there is access to experimental facilities or have expertise in modelling approaches.

The PhD supervisors have students divided into research group. For example the Research Group headed by Dr Andrew Ross are:

- World leading experts in hydrothermal treatment of biomass and waste
- Largely an experimental group with expertise in analytical diagnostics
- Have so far managed to obtained external funding totaling >£2million
- Currently Supervising 14 research students (4 as lead and 10 as second supervisor)
- Supervised 11 successful PhD students

PhD Funding can come from different sources including:-Doctoral training Centre – research Council
Industrial Support- industry led topic, student scholarship and Self-funding

There is significant Stakeholder engagement with various advantages especially creating high impact research which are: Industrially relevant, creating more opportunities for student placements, acts as potential source for co-funding and develop useful collaborative links



PhD students are selected based on a number of desirable skill sets including:- Underpinning background (first degree), Spirit of Enquiry, Team player, Good communication skills, Good experimental skills and Independent learning/show initiative.

The University has a Code of Practice for Research Degree Candidatures which sets out the minimum standards of procedure in connection with the supervision of research degree students at the University of Leeds and provides a framework of shared responsibilities between the University, supervisors and students.

Training of Supervisors: The Graduate Board requires all members of staff at Leeds to attend a course on research degree supervision organised by the Staff and Departmental Development Unit before being recommended for appointment as a supervisor

- **Responsibilities of Supervisor:** Supervisors are responsible for various activities including, but not limited to Conducting, with the student, a training needs analysis, approving a timetable for the work of the student and seeing that it is followed; Advising on all aspects of the research and thesis preparation; making the student aware of ethical procedures and review;
- Making written reports on the student's progress as University Arranging regular meetings with the student and ensuring there are written records of formal supervision meetings Reading and commenting on the whole of the draft thesis prior to submission
- Taking action regarding concerns about a student's unsatisfactory progress
- Reporting to the Faculty/School when there has been no contact with an individual research student or when there has been a pattern of absences

Supervisory Team: All supervisory teams include at least one individual who meets the following criteria: A member of the academic staff holding a permanent appointment of the University or a minimum of three years previous experience of research degree supervision.

Models of Supervision: Some students have a single supervisor (together with a Mentor/Advisor) although most students have a supervisory team which may comprise either

- a) one main supervisor together with a Research Support Group or
- b) One main supervisor with a co-supervisor(s). It is not necessarily the case that the main supervisor will be the most senior



The Research Programme: The first task of the supervisor to assist the student to define the topic which is to be tackled in the course of their research. In some cases the project will have been outlined in detail prior to commencement of study. This is very likely to be the most crucial task performed by the supervisor in the whole course of the candidature.

Realistic Goals: The student should not be burdened with so large a topic that it cannot be treated properly within the confines of the thesis. Conversely, the topic should give sufficient scope for investigation appropriate to the research degree for which the student is registered.

Shaping the project: As the work proceeds, the student contemplates a change in its scope or emphasis, they should seek the supervisor's opinion at an early stage. However, supervisors are reminded that the thesis must be the student's own work, and the student should make the final decision about content and design.

Student Support: There are support for Student Training and Development, Personal and professional development opportunities and Personal Development Plan. The overall aim of personal and professional development activity is to enable researchers to develop their research performance, employability, professionalism and engagement with society.

Recording Student Training: Evidence of a training needs analysis carried out between each student and supervisor. A record of training and development undertaken by the student Records of the official supervisory meetings between student and supervisor

Formal reports on student progress: As a minimum, formal reports on the student's progress should be made by the supervisor as follows: Before completion of 6 months study (First Formal Progress report). Towards the end of the first year (Transfer Stage: Progress report). Annually thereafter until submission of the thesis

Transfer Assessment: The assessment at the transfer stage is intended to identify whether the individual student and the research project have the potential for research at Doctoral level and also to assess whether completion of a thesis within the standard period of study for the programme concerned is a reasonable expectation

Final Assessment: The thesis are submitted at the end of the standard period of study and the PGR attend an oral examination. The examination is led by an external examiner with expertise in the field and an internal examiner.



Assessment Criteria: The thesis must contain evidence of originality, must contain evidence of independent critical ability and should contain matter suitable for publication. Examiners comments on the written style overall presentation of the thesis and performance of the candidate in the oral examination

Opportunities for collaboration exists especially through funding call from organization such as The Global Challenges Research Fund (GCRF) which is worth £1.5 billion, announced by the UK Government in late 2015 to support cutting-edge research that addresses the challenges faced by developing countries. Provide research support for themes within resilient food systems supported by sustainable marine resources and agriculture, sustainable health and wellbeing, inclusive and equitable quality education, clean air, water and sanitation, affordable, reliable and sustainable energy.

Note: Since to larger extent, the above research cuts across most university including those in Africa, hence section 2.4 covers both students and supervisors research management perspectives.

2.5 Development of the Massive Open Online Course (MOOC)

By Prof Jon Lovett, University of Leeds

This is in line with the Sustainable Development Goals (SDG) 4: Education





Transformative education: set the agenda, but since most educational topics get ‘set in stone’, research creates new knowledge but over a time of 10-15 (20) years it should translate into policy. There are also more educational curricula which are fluidic in nature with research-led teaching, it can develop practical skills with continuous professional development.

This type of curriculum can only be unbundles as represented in figure 6&7



Figure 7: Unbundling scenarios one

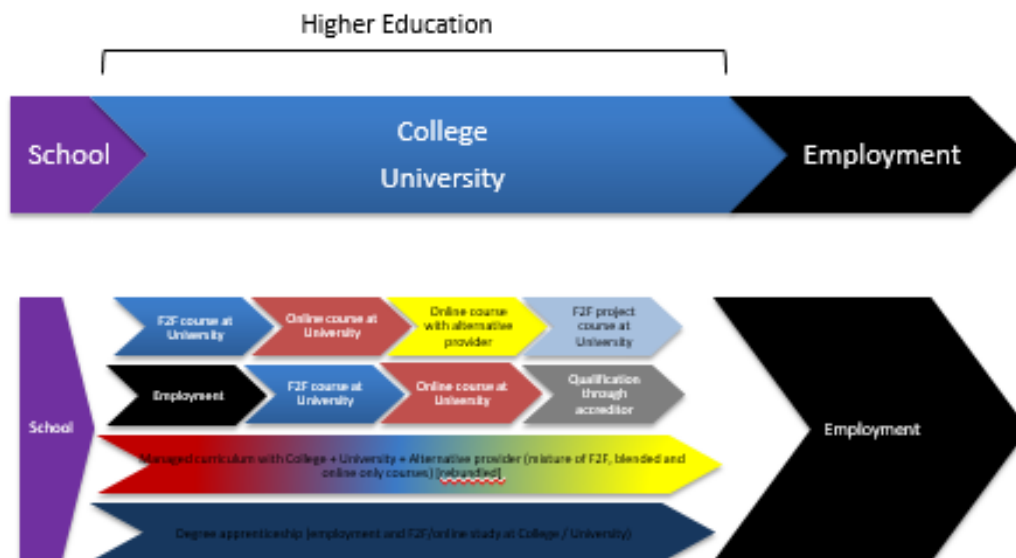


Figure 8: Unbundling scenario two

Why is unbundling happening now in the HE sector?



CREEC
CENTRE FOR RESEARCH IN ENERGY AND ENERGY CONSERVATION
Energy for generations



- The demands from business and industry for more flexible education has increased as well as the ability to offer flexible learning opportunities as a result of advances in digital technology. Government reassures to increase access, reduce inequality, raise employment, and improve flexibility.
- Institutional strategies to diversify student cohort, grow student body, retain student markets and pressure from private / alternative providers creating an alternative HE market.
- Pressure from students for more flexible learning pathways to meet their diverse needs created by actors within organisations who are just making it happen

Example of Unbundled degrees



Degrees

Study online and earn a postgraduate degree from a leading university with FutureLearn. Learn flexibly, pay as you go and gain recognised qualifications.



DEACON UNIVERSITY
Cyber Security

By studying cyber security, you'll have the skills needed by all companies today. Our courses are industry specific, so you study issues important to business – like implementing security technologies to protect against hackers or credit card fraud.

Graduate Certificate

Graduate Diploma

Masters degree



DEACON UNIVERSITY
Development and Humanitarian Action

Cultivate the skills and the knowledge required in responding to national and international emergencies by studying a humanitarian assistance course.

Graduate Certificate

Graduate Diploma

Masters degree



DEACON UNIVERSITY
Diabetes Education

This degree qualifies you as a health professional with a focus on reducing the prevalence and impact of this growing threat to human lives. It is accredited by the Australia Diabetes Educators Association.

Graduate Certificate

Degrees



Master of Business Administration (iMBA)

Executive leadership skills and an accredited degree in an affordable online package.



Master of Computer Science in Data Science (MCS-DS)

Accelerate your career with a flexible, fully-accredited professional Master of Computer Science in Data Science from one of the world's top programs.



Master of Science in Accounting

A cutting-edge degree from an accounting powerhouse, completely online.



Master's in Innovation and Entrepreneurship

A flexible online program taught by world-class faculty and successful entrepreneurs from HEC Paris, one of Europe's leading business schools.

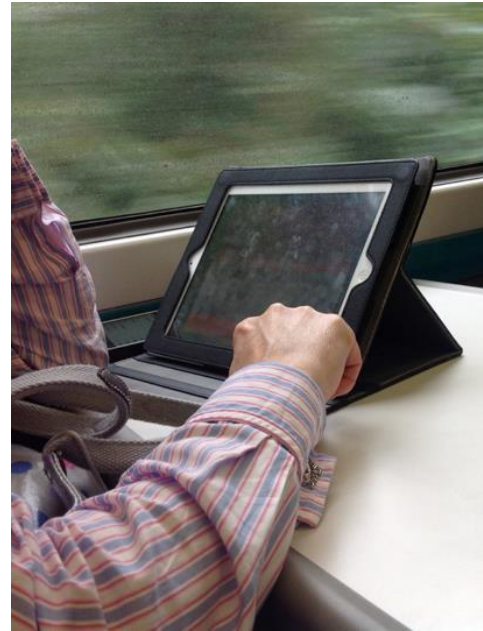
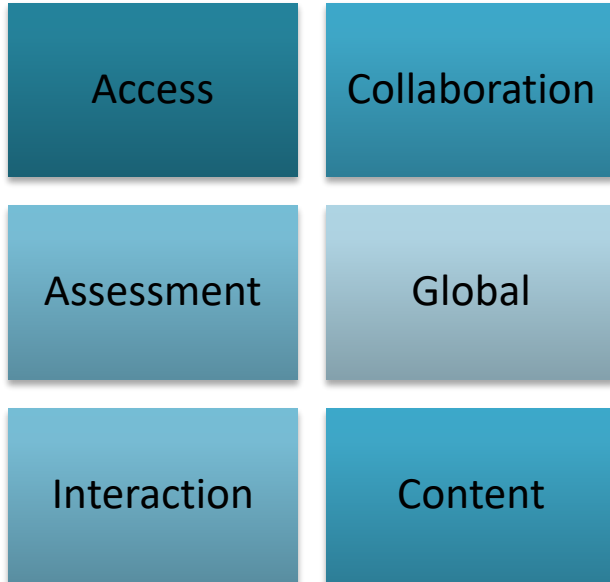
THE
**ROYAL
SOCIETY**



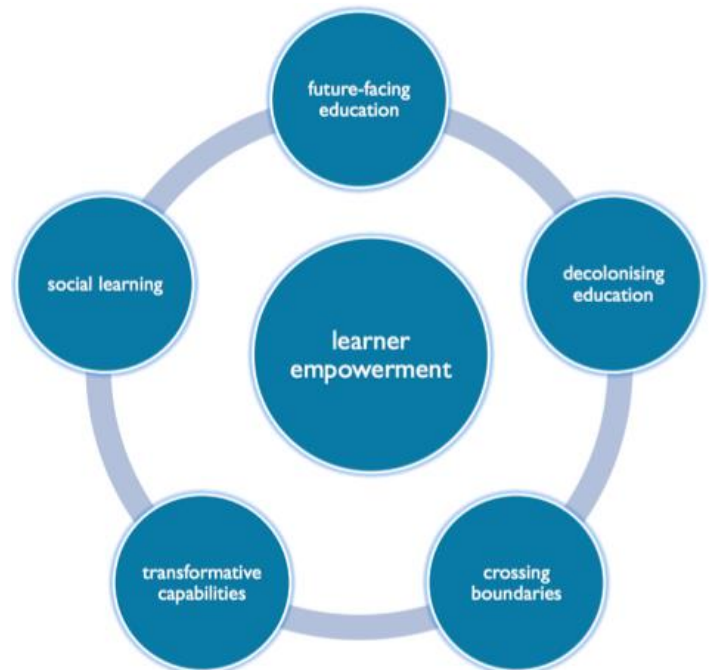
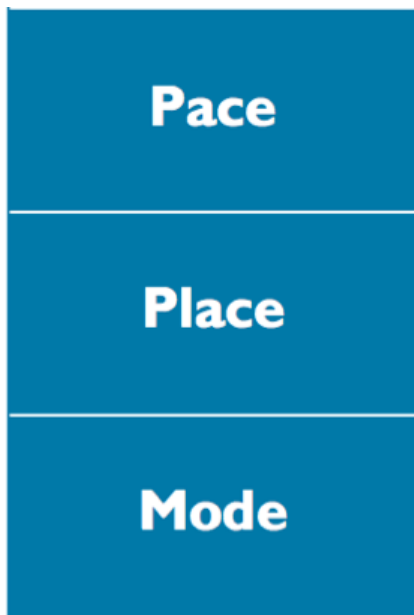
Department
for International
Development



UNIVERSITY OF LEEDS



Flexible pedagogies



https://www.heacademy.ac.uk/sites/default/files/resources/npi_report.pdf

Future of universities?





As stated by Clayton Christensen, Harvard Business Professor, ‘father of disruption’, extreme views about future of universities as a result of unbundling, marketization and digital technology:

- *“Some will survive. Most will evolve hybrid models, in which universities license some courses from an online provider like Coursera but then provide more-specialized courses in person. Hybrids are actually a principle regardless of industry. If you want to use a new technology in a mainstream existing market, it has to be a hybrid.” (Christensen 2013)*

What is the darker side of marketization?

“Recent developments have spurred critical commentaries, pointing to a problematic ‘darker side’ of marketization. This darker side might include, for example, the ‘selling’ of pedagogy to the (sometimes) highest bidder; the fragmenting of the educational offering and the packaging of ‘learning’ into byte-sized attractions; ultimately, this could lead to the trivialization of the challenge of learning and the casualization of academic labor.”(Extract from blog at unbundleduni.com)

Potential benefits and risk of unbounding

Benefits	Risks
<input type="checkbox"/> Access	<input type="checkbox"/> Fragmented curriculum
<input type="checkbox"/> Flexibility	<input type="checkbox"/> Quality / regulation
<input type="checkbox"/> Inclusiveness	<input type="checkbox"/> Misalignment with employer
<input type="checkbox"/> Student-focused	<input type="checkbox"/> Cannibalization of HE sector
<input type="checkbox"/> Market-led costs	<input type="checkbox"/> Further inequality

Example of University of Leeds' journey to unbundled and rebundled Higher Education provision.

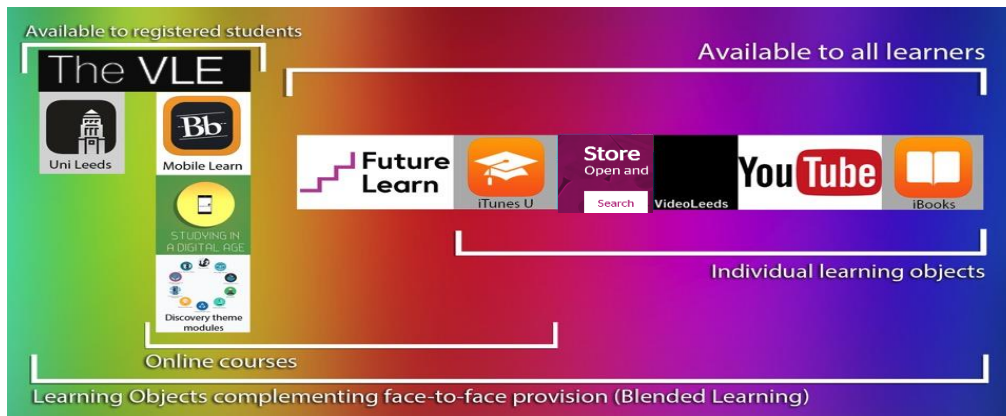
Rationale

- Strategic (Maintaining competitive edge; protecting /growing cohorts; Obtaining return on digital investment through re-purposing; utilizing in-house expertise; focus on internationalization and employability)



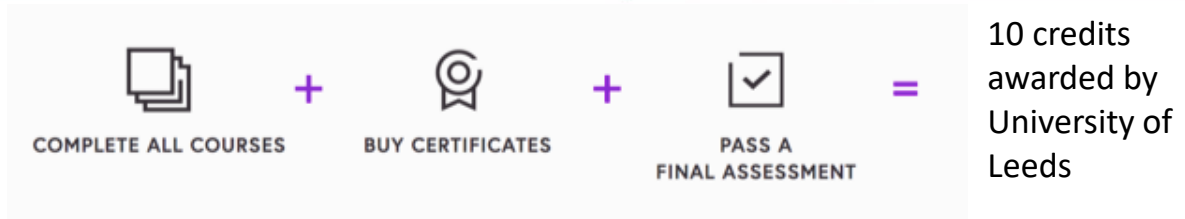
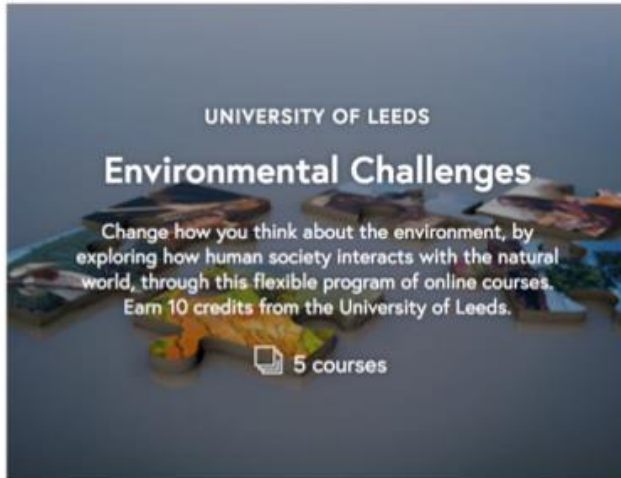
- Student demand (Flexible learning pathways requested; supporting diverse student population across many levels)
- Changing policy landscape (UK HE Bill; UK visa situation; Brexit; focus on skills training; Degree apprenticeships)
- Commercial partnerships (Shared risk; shared values; external expertise; speed to market; innovation)

Examples of digital learning online portfolio





Examples of online standalone credit-bearing courses

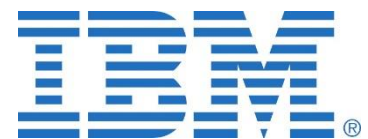


Over 60,000 joiners on these ‘programs’ since September 2016. First credit awards issued February 2017 from learners around the world

Online CPD courses with industry partners



- This platform delivers demand led CPD courses for professionals
- Partnering with organizations to deliver internally facing online staff development courses





How Massive Open Online Course (MOOC) will look like



Categories

Courses

Programs

Degrees



Sign in

UNIVERSITY OF LEEDS PROGRAM

Environmental Challenges

Change how you think about the environment, by exploring how human society interacts with the natural world, through this flexible program of online courses. Earn 10 credits from the University of Leeds.

[Join program](#)

UPGRADE ALL COURSES + EARN CERTIFICATES ON ALL COURSES + PASS A FINAL ASSESSMENT COURSE = EARN AN AWARD

[Support](#)

Existing MOOC experience as operated by Prof Jon Lovett

There are 74000 enrolled participants, from 170 countries. The area 5 two week courses operated as a Stand-alone units for two weeks or take as integrated 10 week course open access or pay for credits incorporated into my Leeds teaching.

⇒ The course structure

First week

- Three principles. Short videos.
- Comprehension exercises
- Research task
- Supporting materials - research-led teaching
- End of week reflection

Week two



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- Classic case studies
- Skills exercise
- Debate
- Questions and answers
- End of week reflection

2.7 Project Funds Management Game

BY Ssenyonjo Andrew, Ignite Potential, Kampala Uganda

The objectives of the game was for participants have experience and practice in

- The basic project funding cycle
- The daily actions and accountability on project funding and results
- Planning the best use of money for uncertainties
- The keep records

The game was designed in a way that the 40 participants were divided into three groups of Green, Orange and Red. Each group elected their own director who was responsible for the day today running the group, an analogy to the company running a project.

The project activities were related to manufacturing and selling of stoves. According to the game. Three forms were provided with details as in figure 8, Table 1& 2





Table 1: Raw material cost chart

EXPENSE	UNIT COST	
Transport – Raw Materials	10	
Unit cost of raw materials	40	
Unit cost of production	40 each unit	
Transport – To Community	20	
Value of units delivered to community	80	
Transport – Office Supplies	5	
Office supply	Your choice	
Proposed Fund transfer schedule	Week 1	2000
	Week 2	1000
	Week 3	500
	Week 4	500

PROJECT FUNDS MANAGEMENT CYCLE CHART

	MONDAY Buy <small>(Pay for Transport Cost of Production Raw Materials)</small>	TUESDAY Make/ Life	WEDNESDAY Delivery <small>(Product Verification & Delivery to community. Pay Transport)</small>	THURSDAY Account Fund Transfer	FRIDAY Budget	SATURDAY Spend <small>(On Office Supplies)</small>	SUNDAY Rest
WEEK 1				1 A= _____ B= _____ V= _____	2 Planned Transfers \$2000 Money Received _____	3 Bought _____ @ _____ Bought _____ @ _____	4
WEEK 2	5 ____ produced @ _____ units @ _____	6	7 ____ units delivered @ _____ units verified @ _____	8 A= _____ B= _____ V= _____	9 Planned Transfers \$1000 Money Received _____	10 Bought _____ @ _____ Bought _____ @ _____	11
WEEK 3	12 ____ produced @ _____ units @ _____	13	14 ____ units delivered @ _____ units verified @ _____	15 A= _____ B= _____ V= _____	16 Planned Transfers \$500 Money Received _____	17 Bought _____ @ _____ Bought _____ @ _____	18
WEEK 4	19 ____ produced @ _____ units @ _____	20	21 ____ units delivered @ _____ units verified @ _____	22 A= _____ B= _____ V= _____	23 Planned Transfers \$500 Money Received _____	24 Bought _____ @ _____ Bought _____ @ _____	25
WEEK 5	26 ____ produced @ _____ units @ _____	27 Rent 100	28 ____ units delivered @ _____ units verified @ _____	29 Full Accountability Report Due	30 Count all expenses _____ Count all money received _____ = _____		

Figure 9: Project management Chart



Reflection on the business game

As per table 3, there is need for a company to make a trade-off of what to always spend on office and employee welfare and what to be used as capital that can sustain and generate more profit

The major important lesson here is the quality of the services/products we offer to the community. If it is poor as for the case of up to 5 products failing the test, it means the company will continue to loose revenue, reputation etc, and the main objective will not be achieved

Opportunity cost on investing less while reserving more money for unforeseen circumstances need to be clearly understood based on the various market for each product.

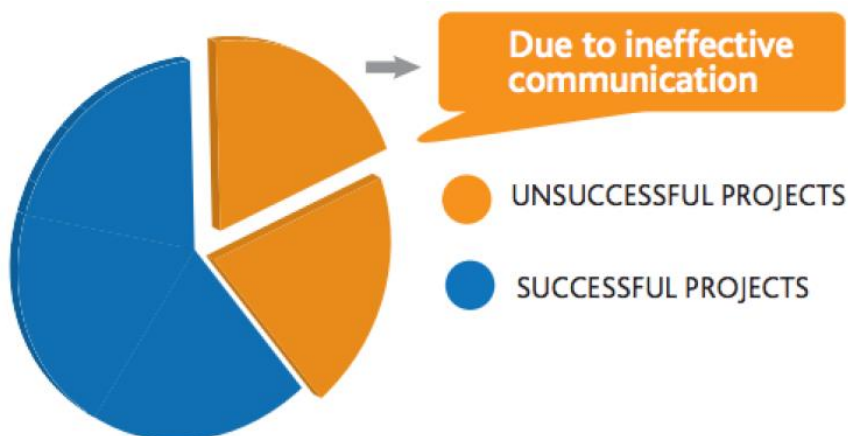
2.8 Integrating communication in RE Projects

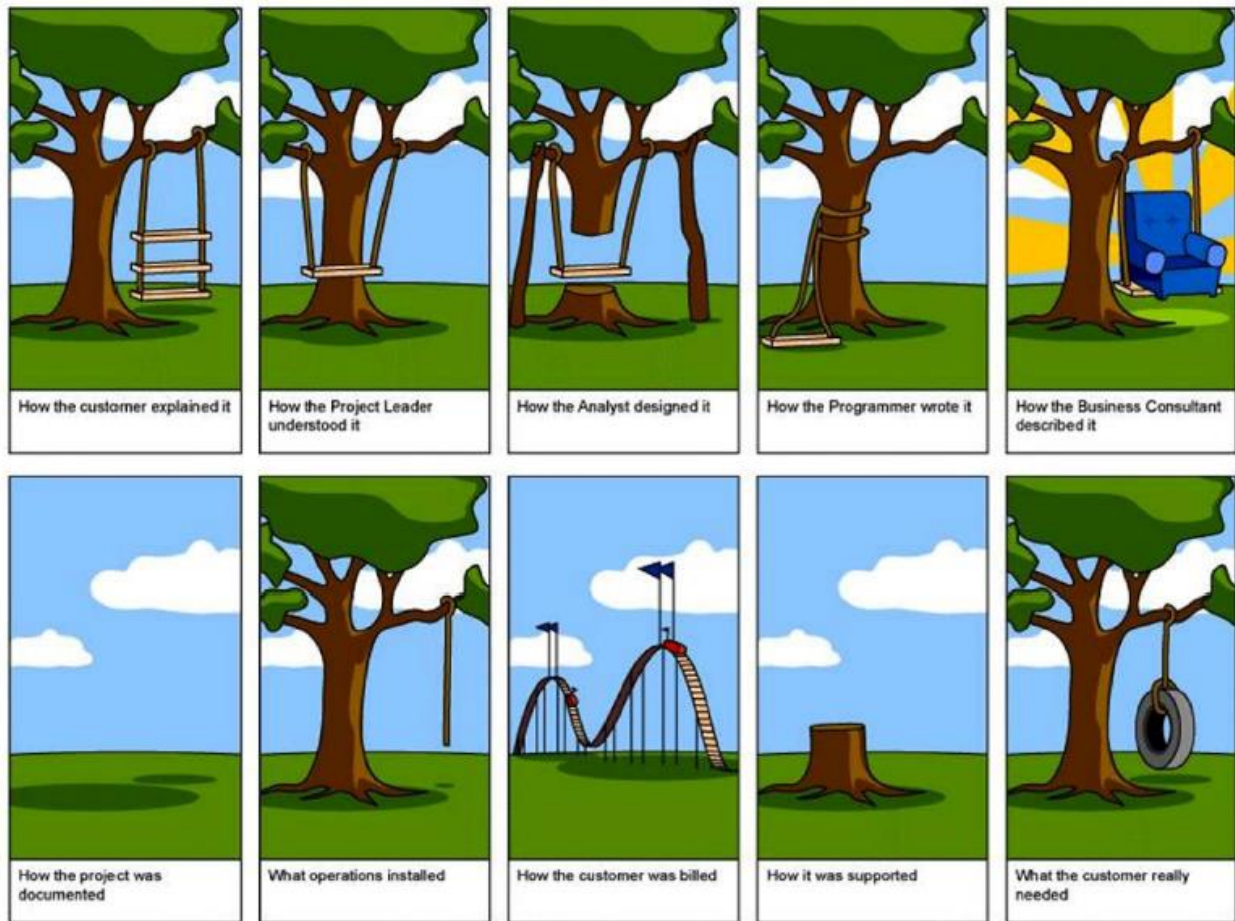
By Ajambo Flavia Martha, CREEC-Makerere University

Introduction

Communication was defined as the process of sending and receiving messages through verbal or nonverbal means including speech or oral communication, writing or written communication, signs, signals, and behaviour. More simply, communication is said to be "the creation and exchange of meaning."

2.8.1 Impact of communication on project management





2.8.2 Ways project management can improve with communication

i. Be Present

As a project manager, you set the tone for your entire team, so one of the most important parts of successful communication is being present. Be the type of manager that is readily available and that has a clear understanding of your team's roles, challenges, and achievements. If you communicate from a distance and constantly rely on indirect forms of communication (like e-mails and voicemail), then you'll foster an environment of passive communication between your team and clients.

ii. Use Project Management Apps

You have a lot on your plate as a project manager; a big part of that role is making sure that everyone is aware of their personal responsibilities. It would be impossible to always check in with everyone on your team to make sure their tasks are progressing as they should, and then to share that progress with the rest





of your team. Project management apps like Basecamp and Asana keep your entire team on the same page throughout the project and streamline communication for a more efficient workflow

iii. **Adopt a Communication Plan**

You should have a general communication plan in place for how you expect your team to communicate. Questions you should ask yourself when creating your communication plan include, “what kind of communication is required?” (Meetings, reports, etc.), “who do I need to communicate with?” (Co-workers, stakeholders, clients, etc.), and “how frequently is communication needed?” Answer these questions to create a general communication plan that can be adapted as needed according to projects.

iv. **Plan Meetings Appropriately**

Meetings are an important part of any work team, but they are kind of a double-edged sword. As effective as meetings can be in facilitating communication, they can also be very time consuming. Plan meetings accordingly so that you reap the benefits of meetings without suffering delayed workflow. Consider what will be discussed at the meeting, who needs to be involved, and how long it should last.

v. **Use an RACI Chart**

If you are having difficulty determining who needs to be involved in which lines of communication, consider implementing an RACI chart. RACI stands for “Responsible, Accountable, Consulted, and Informed.” This helps designate someone who is in charge of each task, as well as who will be assisting in completing those tasks. Not only can an RACI chart help streamline communication, but it can also cut out unnecessary communication that may be inhibiting workflow.

vi. **Engage in Active Listening**

As a project manager, you will have a lot of people come to you with questions, concerns, and ideas. Make sure that you are listening to the people that approach you. This means being 100 percent present, making eye contact, and paying attention to body language. Perhaps most important, process what the person is saying before making a response.

vii. **Take Advantage of File Sharing Apps**

A lot of communication in the marketing world is centred on the sharing and discussion of files. To physically pass around files is a waste of time, and also leaves you open to costly mistakes such as lost files or inefficient workflow. File sharing apps will allow your team to share files in real time, making them





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accessible to each individual's digital device. This will save valuable time, prevent lost files, and increase workflow.

viii. **Use Online Communication Tools when Necessary**

Face-to-face communication is nice, but not always possible, especially in the case of distributed teams. Online communication tools like Skype and Zoom give you the opportunity to bring a group of people together for a discussion in a more personalized way than that which is allowed by e-mail.

ix. **Set Up an Online Review and Approval Process**

One area that is vital to marketing is the review and approval process. Take advantage of apps such as proofing with Work front that streamline the review and approval process. Team members (and clients, if you choose) can share creative content, leave feedback, offer edits, and sign off on approval, all from their own computer, tablet, or phone. Additionally, you can delegate tasks and track where a file is in the review process at any given time. This is a communication tool that truly improves project management while helping facilitate product delivery and project completion.

x. **Celebrate Achievements as a Team**

Communication is not only vital throughout a project, but also once that project is over. Make sure you communicate what went well, and allow your team to celebrate their shared accomplishment. Of course, communication, workflow, and creativity should always be evolving, so it is also good to discuss what should change the next time around, but make sure the energy remains positive and appreciative

2.9 Information and Knowledge Management in RE projects

By Prof Mackay Okure, Makerere University

i. Introduction to Knowledge

This presentation looked at information and knowledge as contextual, relevant, actionable information that changes something or somebody-becoming grounds for action by making an individual, or institution capable of different, more effective action – by Drucker.

In another form, Knowledge was also describe as the synthesis of what we know as facts & figures, experience, ideas, concepts, theories, Principles & practices, how things work around here, how to's, Who knows, Where to go's, What happens if and many others.





Several types of Knowledge were identified, as explicit knowledge, objective, rational, technical, Policies, goals, strategies, papers, reports, Codified, Leaky knowledge. Others include: Tacit knowledge, Subjective, cognitive, experiential learning, highly personalized, Difficult to formalize, Sticky knowledge.

ii. Knowledge Management (KM)

It is known that Knowledge comes from diverse sources, including mistakes in practice, professional Sources/experts, Stuff that's written down/recorded - books, magazines, journals, manuals, websites, videos, audio recordings, etc. Other from presentations, lectures, direct conversation, people you know, opinions, experience, trial & error

Therefore, by practice knowledge management was referred to as systematically & actively managing and leveraging stores of knowledge in an organization, organizational learning mechanisms, processes to create, gather, store, maintain, and disseminate knowledge

Knowledge management is needed for improving decision making by reusing knowledge, capturing knowledge from transient work forces. Today, we need KM because of supporting knowledge communities, Obsolescence/Innovation and Knowledge persistence. In other words, KM is needed for using what we know to: Perform a task, solve a problem, make a decision, create something new - innovate / invent / design and plan a course of action

Knowledge Influences Success but resides in the heads of People especially the Codified and the personalized types of Knowledge. For knowledge sharing to happen systemically, a conduit is required which sometimes demands trust. KM embraces both the Knowledge Based organization and the Learning Organization

iii. Organization, Access and Leverage of knowledge

Knowledge requires capture, organization, access and leverage. Knowledge capture is mainly in digital form and in cyberspace – cloud, meanwhile the organization is mostly via software programs designed upon engineering principles, mathematical equations, word associations in cyberspace 24/7/365. Access wherever the physical bodies link via computers. Particularly tacit knowledge are tapped using many different technological tools e.g. AI. The Leveraging is exponential, multiples upon multiples.

The organizing Knowledge can be in the form of: glossary / vocabulary - list of terms & their meaning; synonyms, homonyms • Keywords - relationship between concepts and chunks of information or



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knowledge. Taxonomy - classifications or sub-groups of content; user-oriented organizing scheme. Knowledge maps - navigational aid to find relevant Knowledge sources (information or people); describes linkages between related bits of knowledge. Indexes - cross-references to sources & locations. Catalogues - collection of indexes

iv. KM and Technology

KM is integrating technologies that aid collaboration and/or knowledge storage. Technology platforms such as: Blogs, social networks, Web, GIS – Data Fusion - Integration technologies (XML, SSE), Visualization technologies, Sensor networks and Social Network Analysis are at play.

Examples of KM in collaborations: Use of platform for collaborative projects improves the ability of project members to collaboratively author documents. Use of blogs or others to create virtual discussion spaces where discussions can continue 24/7 with no physical boundaries. Use of blogs, LinkedIn, or Facebook to create knowledge worker spaces, communities of practice, and social networks. This allows knowledge workers to discover the experts among them and to learn from each other. Use of second life to create virtual worlds for knowledge transfer. Use of blogs to connect knowledge sources for new knowledge creation and repositories of best practices and other artifacts.

v. KM and Data Fusion in RE

Data fusion is about taking different data streams and putting them together to add decision support value. It also allows experts to create knowledge, Utilizes feeds, XML. Main application is GIS which fuses multiple data streams to create mapped knowledge repositories

vi. KM and Visualization

Knowledge Visualization improves knowledge transfer by providing tools that allow knowledge workers to manipulate knowledge into representations that have more meaning (incorporates context and culture). Mapping technologies such as topic maps and GIS create knowledge abstractions based on topics, geography, etc. and to control overload by using knowledge to determine what should be presented. Knowledge portals provide self-directed visualization of knowledge through customization.

Knowledge Mapping allows for better organization of knowledge to facilitate knowledge retrieval. It utilizes taxonomies and ontologies. Mapping technologies such as topic maps and GIS allows organization to organize knowledge based on some taxonomy



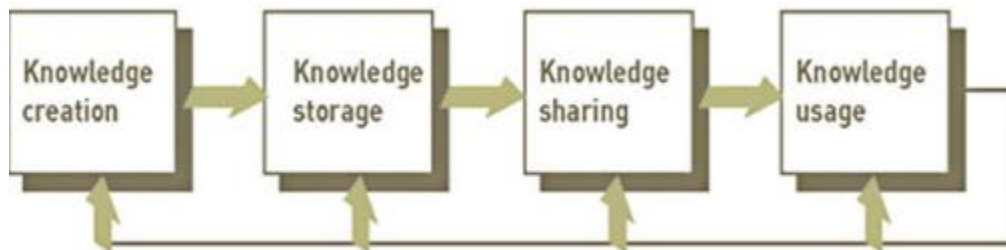
Today's trends are to combine KM with new technologies into strategic organizational initiatives such as: Customer Relationship Management (CRM), Supply Chain Management (SCM), Data mining to discover knowledge, Enterprise Resource Planning (ERP), Project management mature processes, Communities of Practice, (CoP). KM enablers include Leadership, Knowledge champions, such as CKOs, Culture, Access, Technology and Learning Culture.

vii. Knowledge management System (KMS)

Awareness and understanding of a set of information and the ways that information can be made useful to support a specific task or reach a decision requires a system. KMS is an organized collection of people, procedures, software, databases, and devices used to create, store, share, and use the organization's knowledge and experience

Factors critical for success KMS include: - A Knowledge Strategy that identifies users, sources, processes, storage strategy, knowledge and links to knowledge for the KMS. Motivation and Commitment of users including incentives and training. Integrated Technical Infrastructure including networks, databases/ repositories, computers, software, KMS experts. An organizational culture that supports learning and the sharing and use of knowledge

viii. KMS Structure



Examples of KM Initiatives perhaps to: Increase use of some under-used knowledge, enhance sharing, enable capture of tacit knowledge that's not currently shareable, provide an organizing scheme, or Improve access to some store of explicit knowledge



2.10 Data management Presentation.

By Osbert Osamai-National Information Technology Authority, Uganda

This presentation was about how Data Resource Management which was referred to as the development and execution of architectures, policies, practices and procedures that properly manage the full data lifecycle needs of an enterprise. – DAMA International.

Since energy is closely linked to other sectors such as mining and extractive industries, water, transport, urban planning, and environmental protection. To some extent, an assessment of open data in the energy projects should also look at key datasets in these sectors.

Ultimately, the selection of key datasets for the assessment should be mainly driven by the analysis of key challenges within the energy and related sectors and by the existing demand from the energy actors.

Success of open data programs normally rely in part on the state of the national technology infrastructure, which is understood as availability of technology and information and communications services as well as the quality of existing ICT skills among officials, infomediaries, and the general public. The same applies to open data within the renewable energy sector which in this case comprise of Figure 8

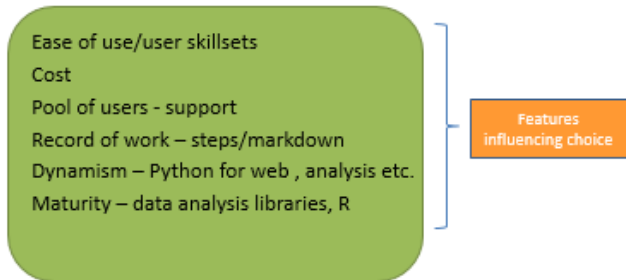


Figure 11: Data management structure



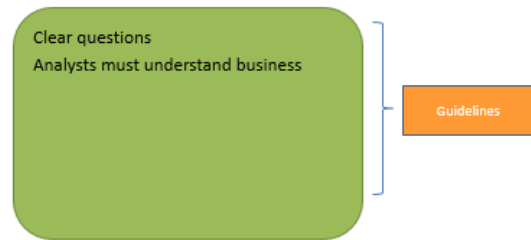
I-Features data management tools

Excel, Python, R, SAS, SPSS , Stata etc.



ii-Identification of business/Project Objectives

- Analysis based on clear business objectives



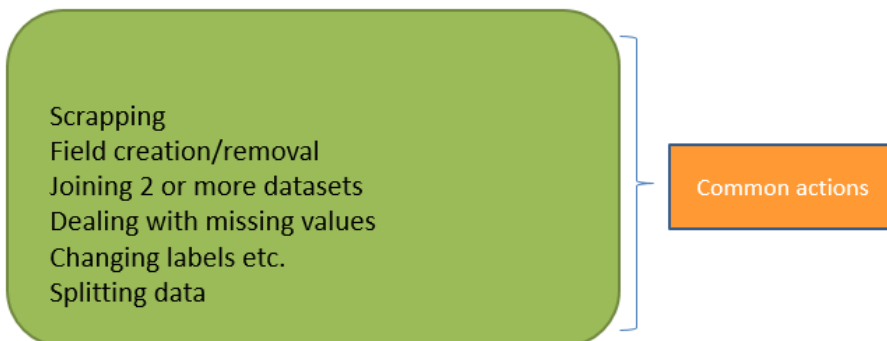
iii- Data acquisition

- Obtaining data for analysis



iv-Data cleaning

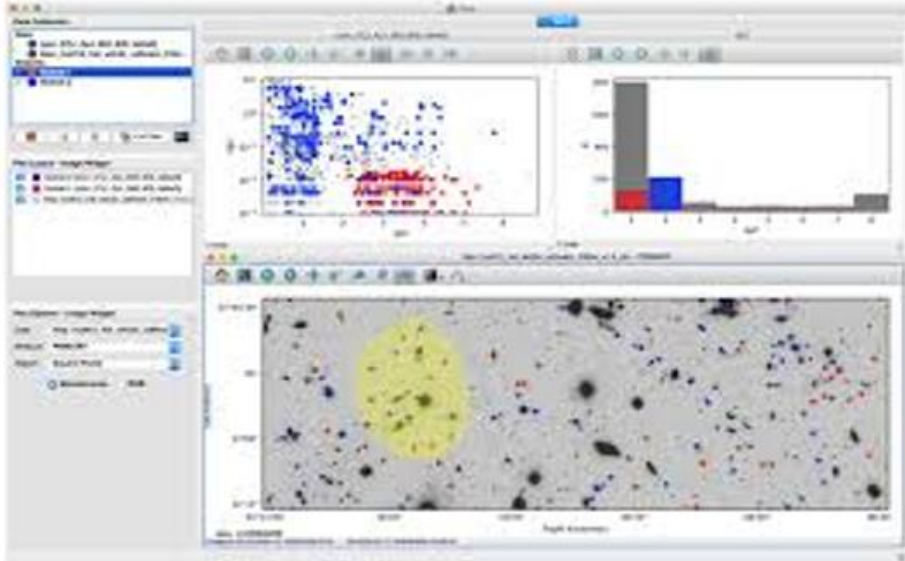
- Presenting data in required format for analysis





v-Data exploration

- Plotting data to identify shape, outliers etc.



vi-Data product/model

- Software application developed for customized analysis usually with an inbuilt model



Presentation of results



- Consider the audience – shared knowledge? Technical jargons?
- Relate to the original goal/problem – “the big picture”
- Explain process/methodology briefly
- Summarize and show main outcome - value

Other issues

- Governance -strategy, policies, processes, standards etc.
- Data security
- Privacy – GDPR/EU
- Data sharing
- Data quality
- Designing data collection tools

3.0 The Award Ceremony

By Mary Suzan Abbo and Prof Jon Lovette

Some of the 42 participants receiving certificates of attendance





Conclusion

The two days intensive training was developed to provide practical learning experiences as well as networking platform for project engineers, entrepreneurs /business managers in Uganda who are working towards renewable energy development projects.

Led by the industry experts from University of Leeds, Makerere University, CREEC-Makerere NITA, among other government agency , and other renowned speakers. As well as the diversity of the audience which included engineers, managers and academicians, from various companies/institutions across the country. The training through the interactive presentation and practical group-work session provided a platform where experiences, were shared, communication skills were learnt, leadership skills were demonstrated, team work was practiced, negotiation skills were honed as well as risk management were learnt.





ANNEX 1

A1: List of ACERA meeting participants

S/N	Names	Position	Address
1	Mary Suzan Abbo	Co-PI	CREEC-Makerere University , Uganda
2	Prof Jon Lovett	Main PI	University of Leeds, UK
3	Prof Bernard M'passi	Co-PI	Marien Ngouabi University, Congo
4	Dr Consalva Msigwa	Co-PI	Dar es Salaam Institute of Technology, Tanzania
5	Dr Anrew Ross	PI & Advisory	University of Leeds, UK
6	Prof Mackay Okure	Supervisor	Makerere University, Uganda
7	Dr Betty Nabuuma	Supervisor	Makerere University, Uganda
8	Dr Sian Evans	Finance Expert	University of Leeds, UK
9	Diane Myers	Documentary Expert	University of Leeds, UK
10	Toby Green	PhD student	University of Leeds, UK
11	Opio Innocent Miria	PhD student	Makerere University, Uganda
12	Tani Mayala	PhD student	Marien Ngouabi University, Congo
13	Mwaka Juma	PhD student	Dar es Salaam Institute of Technology, Tanzania
14	Flavia Jambo	Public Relation	CREE-Makerere University , Uganda
15	Angela Nabagesera	Accountant`	CREEC-Makerere University, Uganda





A2. List of Participants

NO	NAME	COMPANY	TITLE
1	Nizeyimaana Jovan	Presidential Initiative on Banana Industrial Development	Research Assistant
2	Ainembabazi Jackie	Family Health International	Program Associate
3	Anthony Wolimbwa	Climate Action Network Uganda	Coordinator
4	Aroma Patrick	Camkwoki Grassroot Initiative for Development Limited	Executive Director
5	Belinda Mabangi	BAM Enterprises Limited	Director
6	Bernard Keikara	Climatenza	Director of African Operations
7	Emojong Denis	UNBS	Legal Metrology/Energy meters
8	Eriisa Paddy	Kisubi High School-Science and Technology	Laboratory Technician
9	Sarah Sunday Fortunate	Freelance	Freelance
10	Olweny Jancinta	Innovation Africa Limited	Marketing and Administration
11	James Senkumba	Afri-Youth Support Organisation	Director
12	Jim Ssebadduka	CEFA-UG (Clean Environment For Africa – Uganda)	Executive Director
13	John Temperelli	Innovation Africa Limited	Construction Manager
14	Ssemombwe Joseph	Civil Aviation Authority	Strategic Planning Officer.
15	Lamunu Joyce	Camkwoki Grassroot Initiative for Development Limited	Accountant
16	Laura Corcoran	Aptech Africa Ltd	Business Development Manager
17	Mark Muhindo	Kasese Solar Power Ltd	Executive Director
18	Moses Kalema	Fundi Facilities Management	Renewable Energy Engineer
19	Muramuza Robert	GEM Engineering Co Ltd	Electrical Engineer
20	Ocaya Kelvin	Global Business Labs	Business Developer
21	Patricia Kyabaggu	<i>DE-ZYN Forum(U) Ltd</i>	Project Management
22	Prossy Nambajjwe	Village Energy	Technical Field Leader
23	Ritah Muhindo	Women And Girlchild Development Association.	Program Officer
24	Nanddamba Susan	Busitema University	Student
25	Joan Nkiriki	Fundi Facilities Management	Technical Project Management
26	Joy Mukisa	Joint Energy and Environment Projects	Program Officer
27	Ssempala Patrick	Ultra Tec (U) Ltd	Systems Officer
28	Mitala Moses	Necofam (U)Limited	Marketing Manager
29	Steven Ngaciki	UltraTec (U) Ltd	Systems Officer
30	Sanyu Nakiganda	Battery Plus Ltd	Director



A.3 Tentative Program

For The Dfid Training on holistic approaches to Renewable Energy project management

Venue: Makerere Guest House Conference Hall

Day One: Thursday, 26th April 2018

TIME	ACTIVITY	FACILITATOR
08:00 – 08:30AM	Arrival	CREEC
08:30 - 08:40AM	Introductions	CREEC
08:40 – 09:00AM	Introduction to CREEC	Mary Suzan Abbo
09:00 -09:20AM	Introduction to the DFID project (Managing for Impact)	Prof Jon Lovett
09:20 -09:50AM	Research and Innovation Support	Sian Evans
09:50-10:10AM	Presentation by PhD students(Research Management)	-Tania Sandrine Mayala (Université Marien Ngouabi (Congo Brazzaville)
10:10-10:30AM	Presentation by PhD students(Research Management)	-Mwaka Juma (Dar es salaam Institute of Technology Tanzania)
10:30-11:00AM	BREAK TIME	CREEC
11:00 – 11:20AM	Presentation by PhD students(Research Management)	- Opio Miria (Makerere University, Uganda)
11:20-11:40PM	Phd research management at Leeds	Toby Green
11:40-12:20PM	Phd research management at Leeds-the supervisors perspective	Dr Andrew Ross
12:20 – 01:00PM	Development of the MOOC	Prof Jon and Diane Myers
01:00 – 02:00PM	LUNCH BREAK	CREEC
02:00 – 03:30PM	Best Practices on financial management of RE projects: ACERA Project as a case study	Angela Nabagesera
03:30 – 05:00PM	APP LAB on business management using ILO kit	Ssenyonjo Andrew
05:00pm	Departure	





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DAY TWO: Friday 27th April 2018

TIME	ACTIVITY	FACILITATOR
08:00 – 08:30AM	Arrival	CREEC
08:30 – 09:20AM	APP LAB Integrating communication in RE Projects	Ajambo Flavia
09:20 – 10:00AM	Information and Knowledge Management in RE projects	Prof. Mackay Okure
10:30 – 11:00AM	BREAK TIME	CREEC
11:00 – 11:40PM	Data management	Osamai Osbert
11:40-01:00PM	Management of Human Resource for RE projects	Ssenyonjo Andrew
01:00-02:00PM	LUNCH TIME	CREEC
02:00-03:30PM	Management of Human Resource for RE projects	Ssenyonjo Andrew
03:30 – 05:00PM	Award Ceremony	CREEC
05:00PM	Departure	CREEC

