

Implementation of ABC Learning Design for curriculum development in an African context.

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Abstract

This paper reflects an interest and effort in reforming higher education (HE) study programmes through ensuring curricula that are highly relevant to Africa's modern economic and social needs, thus equipping graduates with skills and competences for employability and self-employment.

The context of the paper is the EU funded Erasmus+ Capacity Building Project EEIS-HEA, which has the overall aims of firstly, developing study programmes which are aligned with local, national and regional needs and secondly, integrating entrepreneurship, innovation and sustainability into curricula that are delivered with the use of e-learning through student-centred learning approaches, such as, problem based learning. The project is based on cooperation between HE Institutions in East and West Africa and in the EU.

The ABC Learning Design (ABC LD) is a toolkit developed for curriculum revision at course level, but in this case, it was modified to a study-programme level. ABC LD enables a high level of

engagement, creative informed dialogue and group reflection on curriculum design among time-prioritising academics. Empirically, this study is based on observations, reflection journals, surveys and focus-group interviews with participants from different ABC LD workshops conducted in five East and West African universities.

The aim of this paper is to investigate to what degree the ABC LD is applicable in an African context as a tool for instigating a problem-based learning (PBL) approach within subjects such as Entrepreneurship and Innovation, and Sustainability. The end goal will be new practical knowledge on the applicability of the ABC LD toolkit and recommendations for further development to fit a PBL approach in an African context.

Keywords: Higher Education in Africa, Curricula Development, Student-centred Learning, ABC Learning Design

Type of contribution: Best Practice Paper

1 Introduction

The EU funded Erasmus+ Capacity Building project 'Enhancing Entrepreneurship, Innovation, and Sustainability in Higher Education in Africa' (EEIS-HEA) is the context for this study. The overall objective of the EEIS-HEA is to improve higher education (HE) study programmes through ensuring curricula that are critically relevant to Africa's modern economic and social needs, thus equipping graduates with skills and competences for employability and self-employment.

The EEIS-HEA has addressed some of the challenges experienced by African universities, such as, textbook-based curricula not relevant to and not tackling local socio-economic needs, and outdated pedagogical methods of delivery of teaching that does not lead to expected learning outcomes in terms of relevant graduate competences. The problem seems to emanate from the lower levels of education. For instance, studies have shown that there are considerable gaps between the implemented and the intended curriculum in Tanzanian secondary schools; in other studies, a misalignment between the two has been considered (Kimaryo, 2011; Kira and Kafanabo, 2016). Given that the misalignment seems to emanate from the lower levels of education, lack of an appropriate curriculum that is clearly aligned with pedagogical approaches will hamper the fostering of innovation and entrepreneurial competences in higher learning institutions. Implementation of problem-based learning (PBL) in HE will, among other effects, foster competences in problem-solving, collaboration, critical thinking, creativity and communication among candidates - skills and competences that are indispensable in relation to innovation and entrepreneurship (Dahms et al. 2008). The use of e-resources in curriculum design and teaching has a role to play in developing these skills as it has been observed that the use of IT in teaching, learning and research activities in universities enables students to perform their work more easily; many students understand computer application as a method of teaching and

learning that helps them long-term and improves their examination performance (Adeogun, 2003; Kira, 2016). Further, PBL will provide the opportunity to address real (authentic) local problems as means of learning and thereby equip graduates with skills and competences to promote sustainable economic growth and employment through the creation of new businesses and jobs.

To enable this transformation, EEIS-HEA will support the design or redesign of five study programmes in a collaboration between external stakeholders and five East and West African universities; Kilimanjaro Christian Medical University College (KCMUCo), State University of Zanzibar (SUZA), and Sokoine University of Agriculture (SUA) in Tanzania, and Kwame Nkrumah University of Science and Technology (KNUST) and University of Energy & Natural Resources (UENR) in Ghana. The programmes will address local socio-economic needs and apply student-centred learning approaches, and will be delivered using current and appropriate e-learning practices.

To structure the curriculum development process the constructive alignment model (Cowan et al. 2011, Biggs 2003) was applied as a model for curriculum design. Workshops were conducted with a starting point in predefined intended learning outcomes (ILOs) and assessment was considered in relation to teaching and learning activities.

The Cowan curriculum development model was applied using the following six-step model:

- Formulate outcomes of teaching in the form of intended learning outcomes for the module,
- Design assessment procedures,
- Design learning activities,
- Design teaching activities,
- Evaluate teaching via formative evaluation and summative evaluation,
- Decide on required changes of any element of teaching based on the evaluation results.

The advantage of using this model for curriculum development is that constructive alignment, a fundamental principle for quality teaching and learning in HE, is automatically assured (Fig. 1).

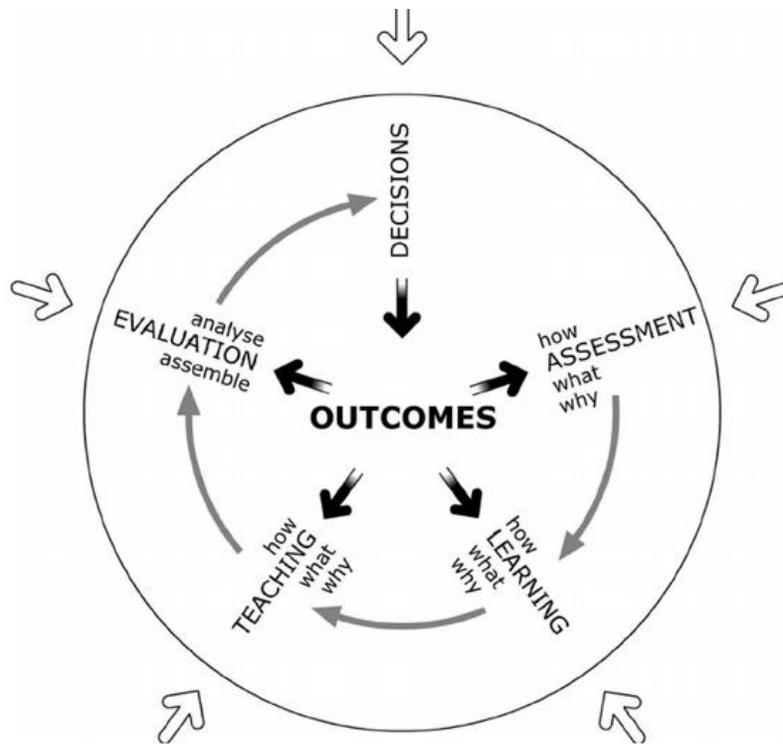


Figure 1: The Cowan Curriculum Development Model (Cowan et al. 1986)

The Arena, Blended, Connected Learning Design (ABC LD) (Perovic and Young, 2015) was introduced to the EEIS-HEA project as a tool for curriculum revision at a programme level. The ABC LD is an effective and engaging hands-on workshop which aligns well with the Cowan curriculum development model. ABC LD helps structure the development process as it provides a prepared toolkit which is easily adapted to the course or programme meant for revision, taking its offset in its ILOs.

2 What is the ABC LD toolkit and how was it applied in the curriculum development?

ABC LD (Perović and Young, 2015) is a toolkit developed by University College London (UCL Digital Education) for curriculum revision at a course level. In this study the toolkit was modified to meet the requirements of curricula at a programme level by redesigning the storyboard to contain one full 2-4 years curriculum instead of only a course (Fig. 2). Four cross-cutting subjects (entrepreneurship and innovation, sustainability, problem-based learning, and e-learning) were also added to the toolkit in order to meet the development perspective for the EEIS-HEA project (see below in Fig.5).

ABC LD is an engaging hands-on workshop where academic teams work together to create a visual storyboard outlining the type and sequence of learning activities required to meet the ILOs.

ABC LD creates a high level of engagement, creative informed dialogue and group reflection on curriculum design among even time-poor academic staff (Young, 2016). The ABC LD workshop was developed specifically for teachers in universities and has already been used successfully in UCL. The UCL team found the method to be highly transferable beyond universities and other universities and colleges in Europe as well as North and South America have also started to use the method. The key to the ABC LD methodology is pace, engagement and collaboration. In just 90 minutes using a prototyping workshop, teams co-create an outlining visual storyboard. (Fig. 2).

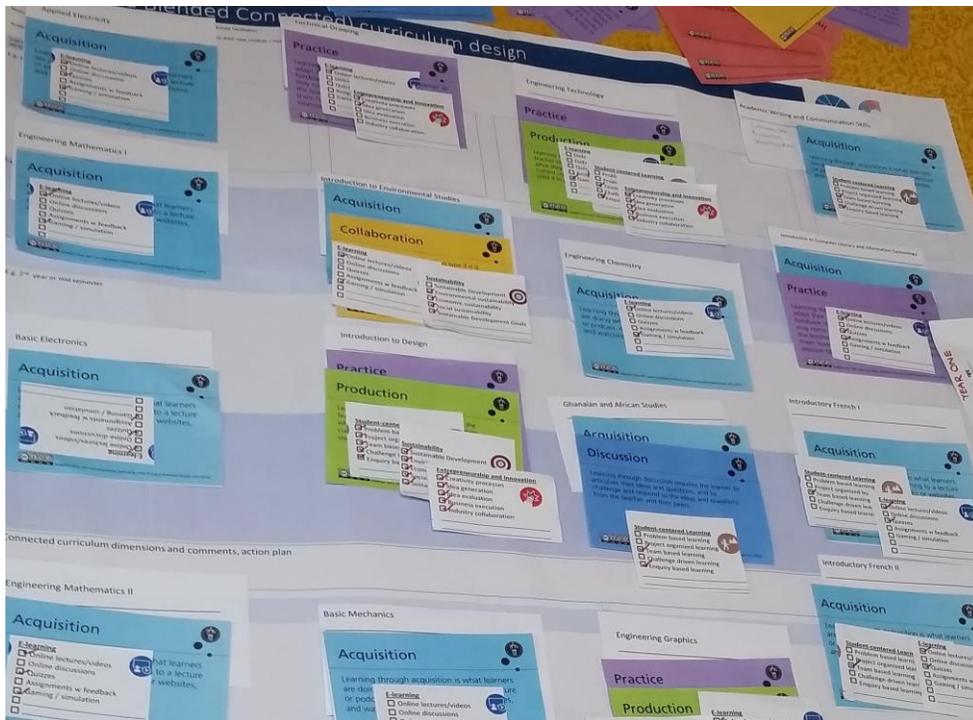


Figure 2: Storyboard from UENR ABC LD Workshop, 3 May 2019

Assessment methods are included and cross-programme themes and institutional policies may also be integrated into the process. ABC LD has been found to be particularly useful for new programmes or those changing to a wholly online or more blended format (Milani et.al. 2017).

The main part of the tool is a card-set with the six learning types (Fig. 3): Acquisition, Inquiry, Practice, Production, Discussion and Collaboration, based on the Conversational Framework of Laurillard (2012; Perović and Young, 2015).



Figure 3: The six cards used in ABC LD, slightly adapted (e.g. Inquiry -> Investigation)

Five study programmes were selected for development, one in each African university. The programmes were described by an overall purpose and ILOs were clarified for each programme and course. The settings for the workshop were seminar rooms with the possibility of arranging tables and chairs into three to seven individual group arrangements. Our version of the ABC LD workshop was organised in the following manner:

- Before the actual workshop, the participants worked with the curriculum ILOs for several hours in order to share a common agreement and understanding of them.
- After a brief presentation introducing the ABC LD toolkit elements and their pedagogical background, the participants were placed in teams of six to eight teachers and recent students.
- The storyboard, large A1 sized paper (See Fig. 2), was filled with time organised course cards (one for each course) for the whole curriculum. In some cases, each team focused on only one year of the programme. The groups reviewed the match between ILOs and the present programme and suggested modifications.
- The teams formulated a tweet size description (unique selling points) of the programme and characterised the blend of learning types (Fig. 4).

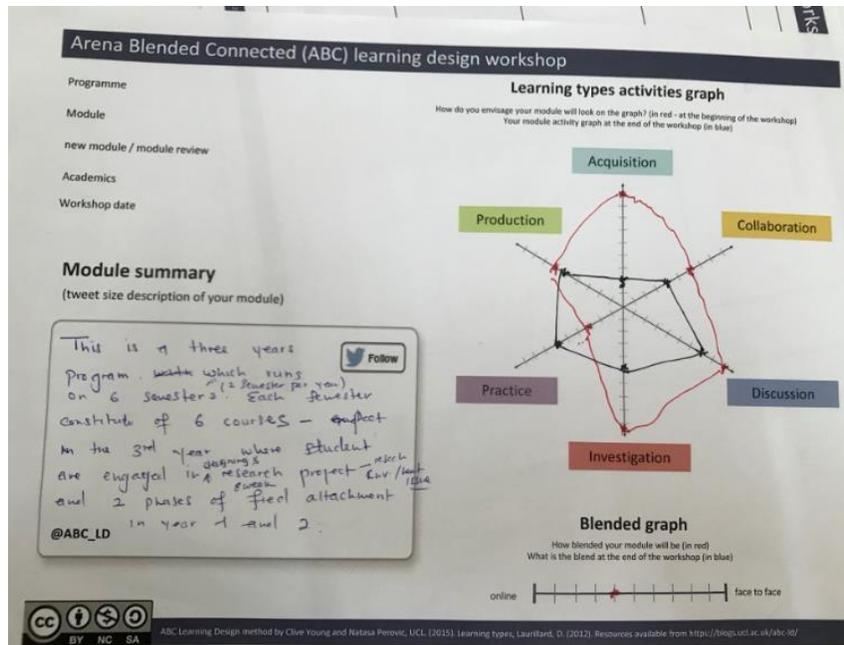


Figure 4: Tweet from SUZA ABC LD Workshop, 2nd May 2019

- In the next round the teams added one or two best characterising learning type cards to each course card, and discussed the picture it created of the blend of learning in each semester.
- Since the aims and objectives of the EEIS-HEA project are to improve the curriculum regarding the cross-cutting subjects entrepreneurship and innovation, sustainability, problem based learning, and e-learning (Fig. 5), the teams placed cards with these headings on the courses where it was particularly relevant to incorporate a cross-cutting subject. They could write quick notes on the cards, so each course could be tagged with useful input to further development. This exercise aimed to give an insight into how well each cross-cutting subject was distributed in the curriculum.

<p><u>Entrepreneurship and Innovation</u></p>  <hr/> <hr/> <hr/> <hr/> <hr/>	<p><u>Sustainability</u></p>  <hr/> <hr/> <hr/> <hr/> <hr/>
<p><u>Problem based learning</u></p>  <hr/> <hr/> <hr/> <hr/> <hr/>	<p><u>E-learning</u></p>  <ul style="list-style-type: none"> <input type="checkbox"/> Online lectures/videos <input type="checkbox"/> Online discussions <input type="checkbox"/> Quizzes <input type="checkbox"/> Assignments w feedback <input type="checkbox"/> Gaming / simulation <input type="checkbox"/> _____ <input type="checkbox"/> _____

Figure 5: EEIS-HEA cross-cutting subject cards

- At the end the teams once again reviewed the ILOs against the (possibly revised) course plan, and filled in a who-does-what table on how to move on in practice.

The workshop typically took 3-4 hours, significantly more than the 1½ hours stated in the original version of the ABC LD (Perović and Young, 2015). After the workshop the resulting storyboards were packed and photographed to be used in further curriculum development.

3 Research approach

Empirically, this study is based on observations, reflection journals, surveys and focus-group interviews with participants from the five different ABC LD workshops conducted in three East and two West African universities.

The observations were conducted both by researchers from EU universities, who organised and facilitated the ABC LD and by workshop participants. Each participating university was also asked to prepare a reflective learning journal, including evaluation and reflection on the ABC LD process and outcomes. Also, follow up focus-group interviews were conducted with groups from seven to twelve participants. In addition, a survey was sent to all workshop participants in the five African universities. In total 37 participants responded.

The workshops were organised as described above and conducted in five African universities:

- Kilimanjaro Christian Medical University College (KCMUCo), Moshi, Tanzania

- Sokoine University of Agriculture (SUA), Morogoro, Tanzania
- State University of Zanzibar (SUZA), Zanzibar, Tanzania
- Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana
- University of Energy & Natural Resources (UENR), Sunyani, Ghana

The ABC LD workshops were conducted in spring 2019 in connection with local teacher training activities as part of the EEIS-HEA project activities. The number of participants varied from 20 to 40 and was composed of academic teaching staff, programme coordinators and students.



Figure 6: Photo from the ABC LD workshop at KCMUCo, May 2019

At the workshops, participants discussed courses and project modules in relation to the redesign of their Programs, as photo (Fig. 6) shows.

Workshop facilitators were from the University of Copenhagen, Denmark; Aalborg University, Denmark; the Royal Institute of Technology, Sweden; and the Polytechnical University Barcelona.

4 Experience of running and participating in the ABC LD workshops in the five African Universities

Observations by facilitators indicate that the format of the ABC LD workshop and presence of colleagues and students clearly stimulated wide-ranging dialogue on the purpose of the programme, teaching and assessment methods, and also the student experience. Because we were looking at a whole study programme/education curriculum, the topic was broader and the

participants were much more diverse than if we had been redesigning a single course. A lot of time was needed for all to comprehend the complexity of the ILOs and the programme layout and, therefore, much more time was needed than the stipulated 90 minutes for a usual ABC LD exercise. However, it was also a great strength of the workshops that the teams could discuss and share their approaches across the whole programme using the same language and illustrations, aiming for a more cohesive student-centred approach across the courses and modules of the study programme. Another observation was that the participants had some difficulties in applying PBL-project units into the curriculum – the storyboard was entirely filled with modules and courses (and no projects) because that was the layout of education at the five universities. Some workshop teams, however, added capstone project units to the study programme.

The participants in the focus-group interviews were asked the following three questions: Q1) In which ways was the ABC LD workshop useful? Q2) Which components were addressed in a useful way? And Q3) how would you like (if you do) to follow up on the ABC LD workshop? These are some of the answers:

Q1) In which ways was the ABC LD workshop useful?

It [ABC LD] gave an opportunity to map the curriculum and then determine which courses should be deleted, retained and/or moved. The number of courses has always been a problem. We did 'cut down' by merging some courses but without reducing credit hours.

The ABC LD gave overview and input on how to do the mapping – but not enough time.

We modified the curriculum by merging and deleting according to whether courses were relevant or irrelevant. This process was initiated by the ABC LD workshop.

Having students looking at the curriculum was a very good thing – students who had gone through the courses. Discussions were factual, not accusing, and took place in an open, honest and polite way. Some of the students were student assistants who had already graduated, so they had nothing to lose. The workshop made us talk among ourselves and that gave a better position to see the overload.

It was useful because it gave us a possibility to voice some concerns that we were not bold enough to complain about in class – in the ABC LD workshop we had the chance.

Q2) Which components were addressed in a useful way?

The programme structure was the most useful component. And it helped to see how and where to embed the four cross-cutting areas into the programme structure.

The overview of the programme structure [Storyboard] – we have used that and it has been a big benefit. The visual impression of the big picture makes it easy to explain to outsiders.

The ABC LD workshop did not address the issue of student time – but it showed the problem of overload – students should have a reasonable workload. We have made room for options in the new curriculum.

The workshop helped us see links between different subjects – we realised how these courses are linked. We could identify overlapping course elements.

Q3) How would you like (if you do) to follow up on the ABC LD workshop?

The first time we did not have enough time, there is a need to do another ABC LD workshop at programme level. There is also a need to do the ABC LD workshop at course level.

ABC LD materials would be good, then we could do the workshop ourselves.

A survey was conducted as an evaluation of training on the cross-cutting subjects and the ABC LD workshop. The three questions below were also asked as a part of the survey.

How did you experience the ABC Learning Design workshop as a tool for curriculum development?

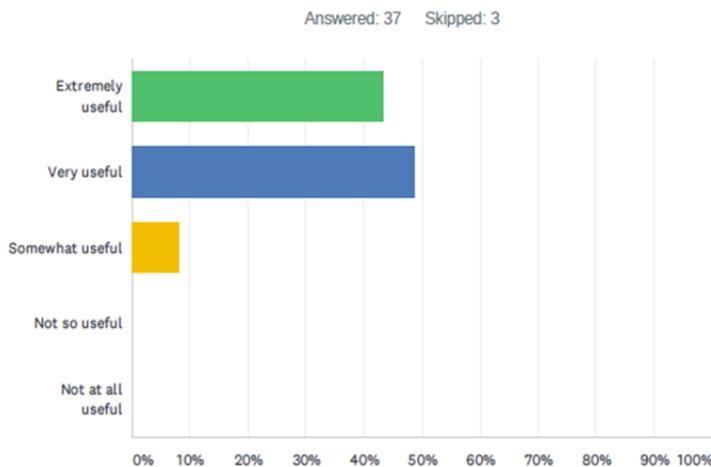


Figure 7: Experience the ABC Learning Design Workshop as a tool for curriculum development?

The response to the utility of the ABC LD process was particularly positive, 91% answered that it was 'Very useful' or 'Extremely useful', only 8% thought it was 'Somewhat useful'.

Q8 Was there enough time during the ABC LD workshop to collaborate and discuss the curriculum development process and fill in the poster?

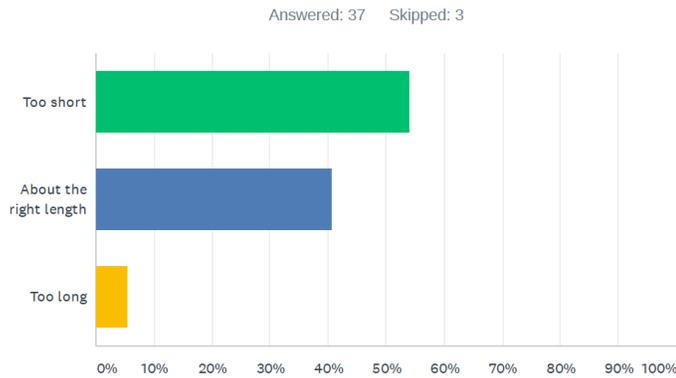


Figure 8: Allocated time for the ABC Learning Design Workshop?

As the pace of the ABC LD process seemed to be a problem the survey contained a question regarding time. The answer was clear, 54% of the respondents still suggested that they had too little time to go through the ABC LD process (even though they had 3-4 hours), but 40% thought that it was about right length of time.

How did the ABC material align with your curriculum development process and elements of Problem Based Learning?

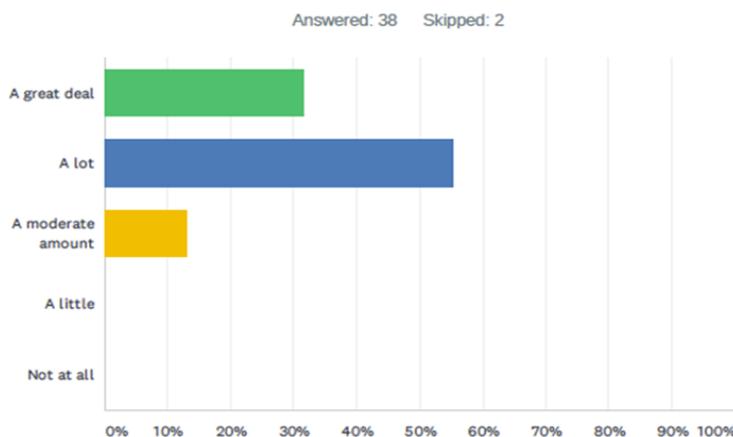


Figure 9: ABC material align with curriculum development process?

The respondents also indicated an alignment between their curriculum development process and PBL, 32% answered that there was a great deal of alignment, whereas 55% stated a lot.

In general, the survey showed great satisfaction with the ABC LD workshops, which was also the observation noted by the facilitators organising the process. Great engagement and collaboration between the participants was observed.

5 Conclusions and Recommendations

The aim of this article was to investigate to which degree the ABC LD is applicable in an African context as a tool for instigating a PBL approach, e-learning, entrepreneurship and innovation, and sustainability. The experiences and outcomes of applying ABC LD in the EEIS-HEA curriculum development project were rewarding. We created new knowledge on the applicability of the ABC LD toolkit and recommendations for developments to fit a PBL approach.

The basis of the ABC LD methodology is pace, engagement and collaboration. Regarding pace, both the focus group interview and the survey indicated that workshop participants experienced a lack of time when completing the ABC LD process and filling in the storyboard, even though it was extended compared to the original layout for courses. A main reason is that the task is different with a full curriculum review and possibly larger. It may also be due to poorly elaborated ILOs for the study programme and the huge number of courses each programme contained. Covering extensive content is possible because teaching in most of the African Universities at the undergraduate level is teacher-centred (Govender, 2019), where content coverage is more important than thinking about developing students' investigative skills. Also, teacher-centred methods, for instance lecturing in the context of Africa, makes little use of e-learning facilities beyond projection of lecture notes in front of the class. This means that partly, instructors were also consuming time in the ABC LD workshop thinking about the ways in which e-resources can be effectively utilised in student-centred perspectives.

From the focus-group interview, *'the number of courses has always been a problem'* (12-16 courses per year in all universities), presumably refers to both student work overload, which became obvious in some programmes, and also the feeling that it is difficult to do large enough projects when many courses cut the learning into pieces. Participants noted the value of the programme structure; *'The [ABC LD] programme structure was the most useful component. And it helped to see how and where to embed the four cross-cutting areas into the programme structure'*. In general, the structured process and also the visualisation was noted by the participants as making *'... it easy to explain to outsiders'*. In the best cases, each course gained valuable notes from the process which those responsible for the course may work with. The process also *'gave us the possibility to voice some concerns'*, but the general impression was that *'discussions were factual, not accusing, and took place in an open, honest and polite way'*. It shows again that the main benefit of ABC LD is that it provides a good opportunity for discussion between different stakeholders, based on a shared clear overview, that would otherwise not occur. In general, the implementation of ABC LD for curriculum development in an African context was beneficial to the process and very well received by the participants; *'The ABC LD materials would be good, then we could do the workshop ourselves'*.

To structure the curriculum development process the EEIS-HEA project applies the constructive alignment model (Cowan and Harding, 1986; Biggs 2003); this six step-model has a starting point of ILOs and then moves on to consider the assessment methods applied before deciding on the learning and teaching activities. The ABC LD structure also has a starting point in ILOs, but in our version with the study programme, it moves straight to deciding on the learning and teaching

content and activities and does not take into consideration the assessment methods - unlike the ABC LD version for course level. This, according to Biggs (2003), is 'risky' as students obviously prepare for passing examinations e.g. multiple-choice and/or reflective assignments, which calls for different learning activities. Considering the high number of courses, assessment is better considered in the course version of ABC LD.

Also, our ABC LD was applied to a course founded curriculum; this is reflected in the toolkit where the cards refer to the language of learning models as 'courses'. When developing a curriculum for a PBL approach the language of the cards should be re-considered as the term 'courses' reflects a certain combination of learning activities in most cultures.

Therefore, in order to simplify the use of the ABC LD model in curriculum design and development in various contexts, firstly, the key issues that need to feature in the curriculum should be clearly understood by the participants; in our context these were the elements of e-learning, entrepreneurship, sustainability and student centred learning perspectives. Such an approach will reduce the number of questions about the meaning of these elements during the actual activity of designing the curriculum.

Secondly, if the curriculum design involves shifting from a teacher-centred to a student-centred model, it is likely to involve more resources at the implementation stage. Therefore, curriculum planners may need to think about the availability of such resources, including the processes involved in mobilising them for easier accessibility by students, before venturing into the curriculum design process. For instance, if a curriculum based in engineering that used to be teacher-centred in developing countries needs to be modified to become student-centred, participants need to be aware of the resources available both directly in the institution and indirectly outside the institution for field attachments. This is where it will be possible for curriculum designers to identify how and when ABCD LD aspects should be applied to achieve the stated learning outcome.

Thus, the next natural step would be to go one step deeper and do the ABC LD exercise at course level, which has also been suggested by some of the partner universities. Further study should be based on determining the extent to which curriculum designers have the knowledge, skills and motivation to apply e-learning, sustainability, entrepreneurship and student-centred learning perspectives in their everyday teaching and learning processes. This could serve as a milestone for training participants on curriculum design and development using the ABCD LD model in various programmes at different levels of education.

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