OER Africa

Learning Pathways Pilot Evaluation

June 2022

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Introduction

As part of a current William and Flora Hewlett Foundation grant no. 2019-9305, OER Africa is developing and testing a flexible approach to continuing professional development (CPD) for librarians and academic staff in African higher education institutions (HEIs). The overall aim of this CPD intervention is to strengthen the quality of teaching and learning at universities supported by effective use of open educational resources (OER). Recent research on CPD in higher education worldwide suggests that academics rarely participate in CPD practices related to teaching and learning, due to numerous barriers, including the following:

- Academics' reluctance to renounce teaching practices with which they are familiar;
- The absence of formal requirements or inducements for teaching development in HEIs;
- A lack of time for CPD among academics;
- HEIs' lack of pedagogical expertise and institutional capacity to develop effective CPD schemes.

(Inamorato dos Santos et al 2019a)

In order to respond to barriers 3 and 4, the OER Africa team adopted a CPD approach that involved the development of "learning pathways". A learning pathway (LP) is described as the chosen route taken by a learner through a range of (commonly) e-learning activities, which allows them to build knowledge progressively. With learning pathways, the control of choice moves away from the tutor to the learner, and follows a constructivist model of learning (Niedderer and Goldberg 1995). OER Africa describes a learning pathway (LP) as a complete set of tutorials on aspects of OER that engage participants in authentic learning tasks. Each learning tutorial consists of several *learning activities*. Academics can engage with the LPs using a variety of devices, and explore them independently based on their needs and available time. The LPs can also be easily incorporated into bigger CPD interventions (including online courses and face-to-face workshops) as appropriate. OER Africa suggests that using this approach to CPD is more cost-effective than traditional face-to-face workshops and can easily be delivered at scale. Such an approach aligns with current research into CPD for HEIs (e.g. Jacob, Xiong and Ye, 2015) that recommends meeting the needs of individual academics, working in communities of practice, and having multiple CPD offerings. Although the international literature does not include academic librarians, we assume that the recommendations are relevant for them as well.

This report provides a description of how the LPs were developed, and how they were piloted across a range of African universities.

The process of CPD Learning Pathways development

In 2019-21, OER Africa developed a series of innovative professional development learning pathways for academic staff and librarians in HEIs in Africa. The standalone online LPs consist of short tutorials that engage participants in authentic learning tasks; these can be done individually, collaboratively, or in a workshop environment. Academics and librarians can engage with the LPs using various devices such as computers, tablets, and smartphones, but require a reliable Internet connection. The rationale behind the LPs is that they can be worked on independently based on one's needs and available time; they are intended to be user-friendly and easy to navigate. They aim to enable academics to improve their teaching and learning capacities, using OER, to provide a better-quality learning experience for their students. So far, seven LPs have been developed and published,[1] each of which focuses on relevant, contextualised practical skills and knowledge development concerned with teaching and learning, and, to a lesser extent, research, at higher education level. The development of the LPs was an action research exercise from which the team drew lessons of experience for improvement (p. 23 onwards). To facilitate such learnings, regular planning meetings

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[1] See https://www.oerafrica.org/book/learning-pathways-open-education-online-tutorials This report describes the evaluation of the first six – see pp. 4-5.

were held, where progress was shared, opportunities were explored, and development was documented for additional LPs to be created.

The design and development process

The designer of each LP first produced an outline and wrote a storyboard, which was subjected to team review to streamline the LP to make it small and focused enough for participants to complete within a relatively short time. The predominant methodology that was used for each of the LPs was the "think, do, reflect" philosophy[2], *Saide* learning design.[3] and a number of bespoke videos which included Africa characters. the latter were important because the great majority of videos available are designed for the Global North, and rarely include people from Africa. The LPs aimed to:

- Work as standalones and provide automated feedback to help participants check their answers to questions in the activities.
- Be intuitive enough for one to complete them independently without any form of facilitation;
- Be highly accessible, with minimal barriers to entry (no registration or password required);
- Incorporate and adapt existing OER where possible, only creating new resources when necessary;
- Be modular, encouraging reuse in different contexts and for different purposes, to accommodate varied needs of potential users;
- Form building blocks for multiple professional development strategies;
- Be multimedia rich to encourage academic engagement; and
- Be based on design criteria, including ease of navigation, appealing layout, plain language, activity-based pedagogy, and consideration of users' context.

Participant engagement with activities was a key design consideration for all the LPs. The activity-based approach was used in developing each one, to avoid participants reading text and listening to the video clips passively. The choice of software to use was also important. Initially the developers considered H5P software[4] but it required quite a high level of technical expertise and experience. Rise software (part of Articulate 360[5]) was used instead and proved to be attractive and very user friendly; the team thought this was more in keeping with the aim of the project initiative, to find a CPD model that could be replicated in African HEIs. It is however important to note that Rise 360 is not open-source software, and this has implications for the future development of CPD offerings. The OER Africa team is currently investigating how the LPs can be converted to an open-source platform.

Evaluation Approach

The development and piloting of LPs was intended as an action research exercise from which the team could systematically draw lessons of experience and share the new knowledge with our key partners. To ensure project success and distilling of learnings, a formative evaluation process was built into the LP project implementation process. The evaluation methodology is underpinned by Improvement Science (Health Foundation, 2011) which includes the Plan, Do, Study, and Act (PDSA) cycle. The PDSA cycle is summarised in Figure 1.

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[2] See https://www.oerafrica.org/content/open-pedagogy
[3] See https://open.saide.ngo/designguide.php
[4] See https://h5p.org
[5] See https://articulate.com/360
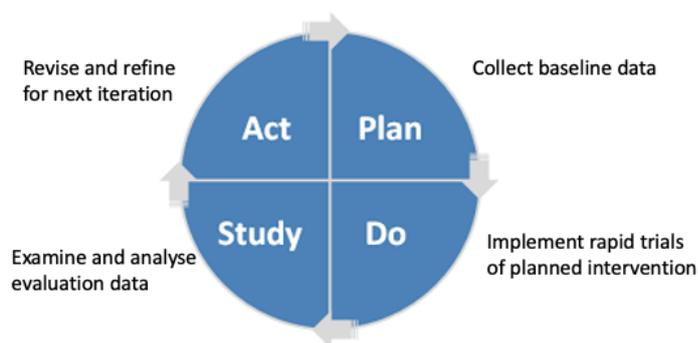
Figure 1: PDSA Cycle

The PDSA cycle assists in clarifying the aim and the envisaged outcomes or changes that have been effected through the implementation of the LP approach to CPD. Apart from identifying changes in practices that have occurred as a result of the given intervention, the improvement science approach also seeks to surface *how* one will know that the desired change has occurred.

Since the project intervention is a professional development initiative, the evaluation framework was also informed by Guskey's levels of CPD impact evaluation (Porritt, 2012). These are, from level 1 to 5:
- Participants' reactions;
- Participants' learning;
- Organisational support and change;
- Participants' use of new knowledge and skills; and
- Student learning outcomes.

The team chose to focus the evaluation to the first four levels only due to the limited implementation time frame. A longer period would be needed to evaluate whether the LPs resulted in improved performance by students taught by academics who participated in the pilot as discussed in the Conclusion.

Evaluation questions

The team developed the following questions that are answered later in this report. Question 3 is answered in the sections for each LP, while questions 1, 2, 4 and 5 are answered in the section on user experiences.
1. Is the design of the LPs coherent and do they enable easy navigation by academic staff and librarians with minimum ICT skills?
2. How do the academic staff and librarians react to the LPs in terms of their usefulness and relevance for their needs?
3. What knowledge, skills and attitudes have participants developed by engaging with the CPD LPs?
4. Are the LPs compelling enough to motivate academic staff and librarians to want to engage with them?
5. What are the potential barriers to implementing this approach to professional development on a large scale?

Developmental testing and critical review

To ensure rigour in design and development, each completed draft LP was subjected to review in two ways. Developmental testing involved identifying typical users who went through LPs to provide feedback on both content and design. Individuals were chosen pragmatically, based on their willingness to participate and their availability to go through LPs of their choice and provide feedback within stipulated timelines. This was followed by critical review, in which individuals with

expertise in learning design were asked to review one LP in its entirety. They were particularly asked for their opinions on specific aspects as follows:

- General
- Outcomes.
- Purpose.
- Structure of pathway.
- Content (relevance, accuracy, sequencing, appropriate level, manageable amounts, etc.)
- Gaps/omissions.
- Activities: Appropriate for the learning pathway and aligned to outcomes; Range to test assimilation of skills and knowledge covered.
- Clarity of instructions related to the activities.
- Will the learning pathway be appealing enough to the audience for which it is designed?
- Pedagogy
- The discussion of the activities is helpful.
- Resources used are useful and appropriately acknowledged.
- Sections build sequentially on what was studied in earlier sections.
- The design attracts, engages and motivates the audience.
- The extent to which the mix of text and media is conducive to learning and acquiring new skills.
- Access mechanisms
- The language level is accessible (appropriate).
- Links to videos and/or readings all work.
- Videos and or other multimedia (images) help to enrich the student's understanding of the content.

Identification of pilot institutions and participants

In 2020, 78 academic librarians and university academics from eight universities were identified through the African Library and Information Associations and Institutions (AfLIA) and the Association of African Universities (AAU). Academics are potential users of the learning pathways, and were identified as participants in CPD when the project was conceptualised. Academic librarians are another key group for CPD; they need to be able to explain OER and Open Access (OA) to all users of libraries, mainly academic staff and students. Some AfLIA participants were also lecturers in their institution's library and information sciences training programs. Some pilot institutions focused on one LP while others worked through more than one. However, data collected in the endline [6]surveys were limited, suggesting that not all those who planned to complete more than one pathway actually did so.[7] A similar process was followed in 2021 with 91 academics and librarians participating.

Administration of the pilots

The following three LPs were piloted in 2020: Finding Open Content (FOC), Adapting Open Content (AOC) and Publish Open Access (POA)

Table 1: Total academic staff who participated in the 2020 pilots

Institutions	Finding Open Content	Adapting Open Content	Publish Open Access

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[6] We use the terms baseline and endline for the pre- and post-pilot surveys respectively
[7] Librarians who participated in the AfLIA pilots received completion certificates, unfortunately before they responded to the survey request. It was a lesson well learned and no AfLIA certificates are now granted until after surveys are completed.

University staff in Botswana, Eswatini, Ghana, Namibia, Nigeria and Uganda	52	51	42

In 2021, the second batch of LPs were piloted, namely Communicate Research Findings, Design for Learning I (How do we learn?) and Design for Learning II (Course Building). As extensive piloting had been done in 2020, a choice was made to pilot these LPs with smaller numbers of participants, but the team tried to ensure that more of them completed the baseline and endline surveys so that the data could be used to determine efficacy of the pathways.

Table 2: Total academic staff who participated in the 2021 pilots

Institutions	Communicate Research Findings	Learning Design I and II (both)
University staff in Botswana, Ghana, Kenya, Nigeria, Tanzania, Uganda and Zambia	42	49

In 2020, although participant names were received from the universities, it is not clear that all participants actually completed all the learning pathways. In 2021, there was more certainty concerning those who completed (see Table 3).

Before participants engaged with the LP, they were introduced to the resource through a video-conferencing meeting (using Zoom). The facilitator explained the purpose of the pilot and the process involved, demonstrated navigation, and asked participants to complete the baseline survey before engaging with the LP. The baseline survey gathered information on the participants' levels of pre-existing knowledge, skills, and competencies related to the particular LP. After the initial Zoom meeting and completing the baseline survey, participants were given a week to go through the LP individually. In 2020, the participants then completed a user-experience survey and joined a Zoom feedback meeting. In 2021, the participants completed the endline survey in which user experience questions were asked. In each of the LPs there is an assignment which the participants were encouraged to complete. While it was not compulsory, only those who completed and submitted the assignment (Table 3) were sent certificates of participation for the learning pathway.

In 2021, in order to increase engagement with the participants, the team created instant messaging groups (on WhatsApp) so that reminders could be sent, and questions they might have as they worked through the learning pathways could be answered. The AfLIA WhatsApp group continues to exist, but with limited exchanges among the librarians.

Given that not all participants managed to go through the LPs and cover all the tutorials and associated reflection tasks within a week, they were allowed to engage with the LPs for a period of 2-3 months in 2020. After this extended period, they completed an endline survey, which had similar items as the baseline, but with the sequence shuffled. The purpose of this survey was to facilitate collection of data on what participants had learnt over the extended period and the extent to which Guskey's levels 1 to 4 had been achieved. Due to the increased engagement with the LPs in 2021, the endline survey was administered within one month of the participants completing the LPs. The respondent data is shown in Table 3.

Table 3: Respondent data

Learning Pathway	Baseline	Endline	Assignments submitted
Finding open content	51	18	23
Adapting open content	39	16	21
Publish open access	35	13	24

Communicate Research Findings	42	24	8*
Learning Design I and II	36	26	22
Total	**203**	**97**	**98**

* Several participants worked together and submitted these assignments.

Limitations

Given the variation in the number of baseline respondents compared with the number of participants that completed the pilot and the endline survey, group percentage analysis was done to ensure that analysis of the data was comparable. However, it must be acknowledged that the relatively low samples in the endline surveys reduced the value of the findings. Such group percentage analysis was clearly a shortcoming, so a statistical test was determine the extent to which the participants learnt anything. *Paired t-tests[8]* were conducted for individuals who completed both surveys, and show whether the findings are statistically significant (removing the bias of different numbers who completed each survey). The paired t-tests cover participants' knowledge of the LP content, but in the cases where the surveys were less knowledge-based (e.g. Publish Open Access), the t-test data included participants' intentions based on the knowledge they had acquired. T-test results are reported at the end of the findings for each LP.

Participation in the pilot was voluntary, which resulted in AAU institutions opting to do different LPs. The AfLIA librarians were assigned their LPs, each one to complete two. As highlighted above, some academics and librarians chose to do all three. Thus, not everyone who completed the baseline survey for a particular LP completed the end line survey for the same LP. Further, the majority of the surveys asked for self-report data from the participants, and those who completed the endline survey might be more motivated and knowledgeable; these issues needs to be borne in mind when interpreting the results.

The other limitation was that the piloting groups were a mixture of academics and librarians working in universities. The two groups are not separated in the analysis as we were informed that many librarians were academics in their own right, with broadly similar kinds of qualifications, and many had lecturing responsibilities. However, this was not necessarily the case, and so future piloting would split the two groups.

Findings

Finding Open Content

The aim of the Finding Open Content learning pathway is to equip academic staff and librarians with necessary skills to search for open content; familiarise themselves with the various Creative Commons licences; and to be able to evaluate the usefulness of OER for their purposes. Fifty-one respondents completed the baseline and 18 completed the endline survey. Sections of the surveys covered awareness and understanding of Creative Commons licences, searching for OER, evaluating OER and participants' prior engagement with and proficiency in using OER.

Identifying OER

The data in Table 4 suggest that there was increased awareness and understanding of the application of various CC BY licences as a result of respondents' engagement with the LP, as the "Don't Know" responses were considerably reduced in the endline survey.

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[8] A paired t-test is an inferential test used to determine the difference between two variables for the same individual, in this case the baseline and endline surveys, and shows whether the findings are statistically significant

Table 4: Questions re the Creative Commons licensing protocol

Questions	Baseline (n=51)		Endline (n=18)	
	Know %	Don't know %	Know %	Don't know %
What does CC BY mean?	53	20	88	0
What does CC BY-NC-SA mean?	39	22	82	0
Which is the most restrictive CC license?	59	37	83	0
Which license is equivalent to the Creative Commons Zero licence?	54	30	67	6
Which of the following is not necessarily a type of open licensed content? (4 options provided)	31	22	31	13
If you publish your research in an open access journal which licence would prohibit others from changing the content of the paper?	45	31	71	0

Searching for OER

Participants were introduced to the use of various search engines such as Google Advanced Search, YouTube Creative Commons filter and Creative Commons Search to provide them with enhanced capacity to undertake OER searches. In the survey, participants were asked to identify the main advantage of using filter search tools within a platform like YouTube. Only 54.2% were able to identify the correct advantage in the baseline survey, while nearly 90% did so in the end line survey, demonstrating a significant gain in knowledge and underscores the potential for academic and library staff to carry out more effective OER searches in the future. In a related question academic staff and librarians were required to indicate which of the advanced search tools they had used before and after the pilot. Table 5 shows comparative results.

Table 5: Tools used to search for open content

Tool	Baseline n=51	Endline n=18
	%	%
Google Advanced Search	78	94
YouTube	26	72
CC Search	18	61
Google Scholar	94	83
Other	16	11

The results in Table 4 show a significant increase in use of YouTube, Creative Commons search tools and Google Advanced Search by the time of the endline survey. Unexpectedly, use of Google Scholar (which does not have a filter for openly licensed content) reduced slightly.

Evaluating the suitability of content found online

One of the most important skills needed in using OER is the ability to evaluate content to ensure that it is fit for purpose and that it will enhance learning. The participants were asked to provide information on how they evaluate the suitability of educational content that they find online. Results of the baseline and endline surveys are shown in Table 6.

Table 6: Evaluating content found online

Evaluation method	Baseline n=49 %	Endline n=18 %
Own discretion	82	59
Consult Friend	43	53
Use specific criteria	37	53
Other	6	0

Table 6 shows an increased use of defined criteria and reduced use of pilot participant's/academic's/librarian's own discretion for evaluation of OER suitability in the endline data. This suggests that academic and librarian staff took on board the more objective approach of applying the OER evaluation criteria discussed in the LP. This is further evidenced by responses given in the endline survey, which highlighted the use of various sets of criteria such as the BC Campus Faculty Guide for Evaluating Open Educational Resources, that were provided in the LP.

One of the academics stated that,

> *I use the criteria outlined during the Learning Pathway lecture: content coverage, accessibility, can licence clearly be used by students? and how it is going to be used.*

The endline survey also provided evidence that, after engaging with the LP, academic staff were inclined proactively to search out other examples of standardised OER evaluation frameworks. The following examples were cited in their free responses to the endline survey:

- Affordable Learning Georgia OER Criteria.
- Illinois University Library: Evaluating OER.
- Achieve, a non-governmental organisation in the USA that supports student success and offer a range of online tools for evaluating teaching and learning materials.

Thus, engaging with the LP seems not only to have exposed academics to possible evaluation frameworks, but also to have increased their appreciation of the importance of conducting a more systematic evaluation of OER before using them.

Level of engagement and proficiency in searching for OER

Participants were also asked to indicate their familiarity with OER and their experience in searching for and using OER in their academic work. The questions were meant to elicit data about participants' prior engagement with, and proficiency in, using such resources.

Table 7: Level of engagement and proficiency in searching for OER

	Agreement with statement		Disagreement with statement	
	Baseline %	Endline %	Baseline %	Endline %
Not heard of OER	18	0	64	60

Have awareness of OER	79	94	18	6
Have come across OER in my work	81	88	14	12
Have previously searched for OER	65	89	30	12
Have evaluated OER	44	83	51	17

The data in Table 7 confirm that academic staff who completed this LP became more aware of the existence of OER. The LP also gave academic staff an opportunity, and more confidence, to search for OER, which is also evidenced in the Table 7 data.

The baseline results show that 18% of the respondents reported that they had not heard about OER. In the endline survey, none of the participants reported that they had not heard about OER. Whilst 79% of participants reported that they had awareness of OER at the baseline stage, awareness of OER had grown to 94% by the time the endline was administered. A greater percentage of participants (89%) also reported that they had searched for OER in the endline survey than in the baseline (65%). About 44% of academic staff in the baseline and 83% in the endline survey reported that they had undertaken some OER content evaluation.

T-test result

The statistical test was based on the 14 participants who completed both surveys. It analysed all correct and incorrect responses to eight questions, which tested knowledge about open licensing and searching for open content.

T = 2.96

p-value = 0.011

Effect size = 0.79

These figures indicate that the average between the baseline and endline tests is statistically significant with a large effect size, suggesting that the LP had a positive effect on participant learning.

Adapting Open Content

The aim of the Adapting Open Content (AOC) learning pathway is to equip academics and librarians with the knowledge and skills that are necessary for adapting OER to suit particular contexts. Thirty-nine participants responded to the baseline and 16 to the endline survey. Sections of the surveys covered understanding adaptation and the licences that permit adaptation and repurposing, attribution, considerations involving revising and remixing, understanding the 5Rs (Remix, Retain, redistribute, Revise and Reuse) and what changing a resource entails.

Adapting OER

Participants were asked questions that required them to show their understanding of what adapting OER involved. The survey also required them to show whether they understood why it is necessary for them to adapt OER. Table 8 shows survey results of these two questions in the baseline and endline surveys.

Table 8: Understanding adaptation of OER

Questions	Baseline %	Endline %

Able to identify a process that does not involve adapting an OER (4 options provided)	54	75
Provide correct response to: Why is it necessary to be able to adapt a resource?	85	94

Table 8 shows that the academic staff started out with a good understanding of what OER adaptation entails and why it is important, but that there was an increased understanding of the rationale for adapting OER after completing the LP, as evidenced in the endline responses.

Understanding CC licenses that permit adaptation and repurposing

To check understanding of the type of licence that permits resource adaptation, respondents were asked the following question: Which of the following licences permits resource adaptation and re-purposing?

Table 9: Identification of a licence that permits adaptation and repurposing

Licence type	Baseline %	Endline %
CC BY NC SA	54	94
CC BY ND	18	6
CC BY NC ND	5	0
Copyright ©	10	0
I don't know	13	0

Table 9 shows that a significantly greater percentage of respondents in the endline survey were able to identify the correct answer than had been the case in the baseline. This reflects increased understanding of open licences gained by the academic staff after engaging with the LP.

Respondents were also asked to identify a CC licence that requires that the licence used on any derivative be the same as the one on the original resource. In the baseline, 74% of respondents correctly identified the CC BY-SA licence, while in the endline survey the percentage of correct responses had risen to 81%. Results of the endline survey also showed that there was increased understanding of processes that involve changing or repurposing a resource.

Attribution of OER

As a way of checking their understanding of the importance of acknowledging the original creator of an OER, respondents were asked to indicate whether the following statement is true or false:

This is a principle generic to all Creative Commons licences: *When you produce a derivative from a resource with a CC BY-NC licence, it is not necessary to attribute the creator of the original resource.*

In the baseline 51% of respondents answered correctly, compared with 94% in the endline survey.

Considerations regarding revising or remixing OER

The baseline survey data reflected that 64% of the pilot participants were able to identify the factors that are important to consider when an OER is revised or remixed. In the endline, this figure was 69%. A greater percentage of respondents in the endline survey (81%) were able to identify appropriate formats in which they should release sharable resources than those in the baseline survey (49%). Such results indicate increased understanding of what resource adaptation entails and the type of CC licences that allow such adaptation.

Understanding the 5Rs

The baseline and the endline surveys collected participants' understanding of the 5Rs of OER (See Table 10). Respondents were asked to match each of the terms with the correct description given in a matrix. Table 10 shows comparison of the baseline and end line results; figures in the table show the percentage of respondents who were able to match each of the five terms to the correct description:

Table 10: Comparison of correct understandings of 5Rs between baseline and end line

	Baseline %	Endline %
Remix	87	100
Retain	90	88
Redistribute	67	81
Revise	74	69
Reuse	23	81

Results in Table 10 show increased understandings of what Remix, Redistribute, and Reuse mean in the end line compared to the baseline survey. Slightly lower percentages for understanding of Retain and Revise in the end line compared to the baseline data are likely due to sampling error.

Data was collected on participants' understanding of processes that entailed changing of a resource as compared to simply using or sharing it, and how to acknowledge any derivatives. Participants were also required to identify, amongst given options, factors that need to be considered when revising or remixing a resource. Table 11 below shows this comparison.

Table 11: Understanding of what changing a resource entails and licensing

	Baseline %		End line %	
	Correct answer	Don't know	Correct answer	Don't know
Which of the following processes involves changing a resource?	85	5	100	0
How to acknowledge a derivative resource with CC BY-NC licence.	51	15	94	0
Identifying factors important to consider when revising or remixing a resource.	64	13	69	0

Table 11 shows that there was increased understanding in all the areas around which questions were asked, namely correct processes associated with changing a resource, how to acknowledge a derivative developed from a resource with a CC BY-NC licence and identifying factors to consider when revising or remixing a resource.

T-test results

The statistical test was based on the 11 participants who completed both surveys. It analysed all correct and incorrect responses to 20 questions which tested knowledge on adapting open content.

T = 0.69

p-value = 0.504

Effect size = 0.21

These figures indicate that the average between the baseline and endline tests is not statistically significant and has a small effect size, providing no evidence that the LP had a positive effect on participant learning. However, open-ended questions in the endline survey suggest that at least some of the participants not only learnt but also applied their learning, as shown in the following section.

Publish Open Access (POA)

The main purpose of this LP is to impart information and knowledge on open access publishing, the practice of making research outputs and data freely and widely accessible to as many people as possible and without various licensing restrictions. Thirty-five participants responded to the baseline compared with 13 who responded to the endline survey. Sections of the surveys covered open access licensing conditions, types of open access, how to identify reputable journals for publishing (including predatory journals), the advantages and disadvantages of OA.

Basic understanding of Open Access Publishing licensing conditions

Table 12, shows that, at the baseline, most respondents could identify the open access publishing symbol and understood that there was no payment involved in using open access articles. However, only just over 50% were able to distinguish between the rights accorded by open access publishing to adapt content, versus, the lack of rights to adapt content in traditionally published articles. The results of the endline survey do, however, reflect an improvement in the respondents understanding of the licencing conditions.

Table 12: Basic understanding of Open Access Publishing licensing conditions

Questions	Baseline %	Endline %
Do end users pay to access Open Access articles?	97	100
Identification of the symbol ∂ **that indicates open access**	93	100
Ability to distinguish between traditional and open access publishing in respect of rights related to content adaptation	32	54

Gold and green open access[9]

The baseline and endline surveys tested participants on their understanding of different types of open access publishing, i.e. gold and green open access publishing. In the baseline survey, only 39% correctly identified that, in gold open access publishing, authors retain copyright. In the endline survey, this percentage increased to 54%. Whilst this showed improvement in the understanding of Gold Open Access publishing, the results still show that many participants struggled to understand this concept.

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[9] **Gold open access** is where an author publishes their article in an online open access journal. In contrast, **green open access** is where an author publishes their article in any journal and then self-archives a copy in a freely accessible institutional or specialist online archive (repository), or on a website.

Identifying reputable open access journals and publishers

The baseline survey indicated that participants were able to identify factors that are important to consider when choosing a reputable open access journal or publisher. However, the endline results reflect a positive increase in the respondents' ability to identify key factors to take into consideration, see Table 13.

Table 13: Ability to identify reputable open access journals and publishers

Questions	Baseline %	Endline %
Ability to identify factors to select a reputable open access journal?	83	100
Ability to identify factors to select a reputable open access publisher?	74	92

The increased knowledge of how to identify reputable open access articles and publishers highlighted in the endline results is important in ensuring that they do not work with disreputable publishers. Respondents were asked to give reasons why they would not publish in predatory journals. Responses to both the baseline and endline survey mirror each other quite closely.

Directory of Open Access Journals

Participants were also asked to indicate if they know about the Directory of Open Access Journals (DoAJ) and whether they had ever used it to search for open access content. The baseline results reflected a high degree of pre-existing knowledge of the DoAJ, with a significant number of respondents reporting that they had used this directory prior to undertaking the pilot course. The endline results do however, still show an increase in both the knowledge of the DoAJ and of its usage (Table 14).

Table 14: Awareness and use of the Directory of Open Access Journals

Questions	Baseline %	Endline %
Percentage of pilot participants that knew about the DoAJ	94	100
Percentage of pilot participants that had used the DoAJ	84	100

Advantages and disadvantages of open access academic publishing

Participants were asked to give reasons why they would choose to publish through open access. The responses provided in the baseline and endline surveys did not differ much. Common reasons given in both surveys were:

> *To gain visibility through more citation; to enable wider access to one's work; and to enable the research community to have free access to research content.*

Participants also responded to a question on what they consider to be the main disadvantages of traditional publishing to the author. As in the previous question, there was close alignment between the before and after responses. Table 15 provides a summary of these responses, which include both correct and incorrect responses before and after completing the LP, suggesting that the topic is sufficiently complex to warrant further engagement. In this case, working through a short online tutorial is insufficient to result in deep learning.

Table 15: Responses to the question on the disadvantages of traditional publishing

Baseline Responses	Endline Responses
Not many people or entities get to access the research output; there is limited visibility	Paying for article processing
The method is very expensive	Author cedes copyright of the article to the publisher and pays to access their intellectual output.
Takes a long time to publish	Expensive to publish one's work
Author visibility and impact of both the author and the research result is restricted.	Restrictions to use published work
He makes no profit from his works	Paying processing fees for articles
It takes time for the audience to get the work.	The number of readers that can see and access the article is reduced hence reducing the number of citations.
I will still retain copy right of the work and make it the work open to the public to access	Costly and requires more time to have public access the author's work.
High fee charged by publisher's publication and discrimination in the selection process	
Is more of business venture	

Respondents were also asked to identify the disadvantages of traditional publishing to the public. Responses given in the two surveys were generally similar. A common disadvantage cited was that there is limited return on investment because of the pay wall that prohibits access to publications by many people. Another disadvantage mentioned is that the public pays twice, initially to support the research (by paying taxes that support publishing in higher education) and then to access the research output. An important point raised in the baseline is that the public is unable to access good research content which is published in high impact journals. This is due to the prohibitively high costs of accessing such journals. A typical example of this is how many African universities can hardly afford to access databases with rich research resources due to the exorbitant subscription fees charged. Respondents indicated that failure to access research results published in traditional journals sometimes leads to duplication of effort. Most of the universities involved in the pilots, with the exceptions of South Africa and maybe Botswana, have free access to HINARI[10], AGORA, and the other varieties of compendia to give access to paywall protected journals.

Reasons why you may choose to publish through Open Access.

To gauge understanding of the merits of publishing through Open Access, participants were asked to give reasons why they would choose to publish through this option. Responses given in the pre and endline surveys were generally similar. Common responses were:

> *To gain more visibility through more citation.*
>
> *To allow research community free access.*
>
> *People have unrestricted access to my work. People do not pay money to access my research and the impact of my article will be high.*

Thus, most respondents in both the baseline and endline survey were of the opinion that Open Access publishing benefits them as authors because many people are able to access their work and this makes them popular as researchers. They also felt that more readers are able to access their work since they do not have to pay in order to access the publications.

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[10] See https://en.wikipedia.org/wiki/HINARI

A subsequent set of three interviews with AfLIA participants resulted in this response[11] from Dr. Kaddu, a lecturer at the East African School of Library and Information Science at Makerere University:

> *I really want people to put their content out in the public domain, so that it can be utilized. If we publish to a greater audience, who are available to comment on our work, we can only improve. When info is in the open, it attracts many benefits. I no longer want to have it 'closed' – that's selfish, and it's not taking Africa anywhere. We need to add on to the existing literature, content, and data we have. We want to promote our scholars.*

Explain what you understand by predatory or deceptive publishing

The LP highlighted characteristics of predatory journals and why it is not a good idea to publish through them. Both pre-pilot and endline surveys had items that tested participants' understanding of predatory journals. Common responses were given to both surveys, that included the following: predatory journals are not peer reviewed, they are not professional, they are after making profits, they can disappear overnight, and they usually do not provide sufficient information about their editors.

Both the baseline and endline surveys reflected that most (all but two) participants had a good understanding of what predatory journals are and of why they are problematic. The endline survey reflected that 100% of respondents understood what a predatory journal was and the pitfalls of publications that promote self-interest at the expense of quality and scholarship.

Respondents were asked to give reasons why they would not publish in predatory journals. Responses to both the baseline and endline survey mirror each other quite closely. In summary, respondents highlighted that, in a predatory journal, the lack of peer-reviews impacted negatively on the value and credibility of the research. Further issues raised included concerns regarding professional reputational damage and the possibility of compromising promotional opportunities.

The following response in the endline survey characterises participants' understanding of these journals:

> *Predatory publishing is a publishing outlet with the primary objective to extort money from their victims without following the scientific peer review process. They often solicit for articles with a promise of speedy turnaround of publishing. They often cover very wide scope of disciplines when they don't have relevant expertise. Their editorial boards are also questionable. They are not indexed in credible databases and the contact is often questionable.*

Although the responses in both surveys were similar, the above quoted response is more comprehensive and shows more nuanced understanding of deceptive publishing. This deeper understanding of predatory publishing may result from engaging with the LP. It is also worth noting that two respondents to the baseline survey explicitly stated that they did not know what predatory publishing was all about.

T-test result

The statistical test was based on the ten participants who completed both surveys. It analysed all correct and incorrect responses to eight questions which tested knowledge about open access.

T = 3.54

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[11] See Opening education: What role do librarians on the African continent play? September, 2, 2021. https://www.oerafrica.org/content/opening-education-what-role-do-librarians-african-continent-play

p-value = 0.006

Effect size = 1.12

These figures indicate that the average between the baseline and endline tests is statistically significant with a large effect size, suggesting that the LP had a positive effect on participant learning.

Communicate Research Findings

The purpose of this LP is to enable researchers to appreciate that they can share their research findings beyond academia. The pathway gives the rationale for communicating their research to different audiences, shows how the message and language are paramount in such abridged summaries, and shows how to release under an open licence. Forty-two participants completed the baseline survey compared with 24 who responded to the endline survey. The surveys covered if and where participants have published outside academia, the potential benefits of doing so, potential audiences, the use of plain language, social media, the application of an open licence, and translation. Due to the nature of this learning pathway, there was less content knowledge or skills for participants to learn. Instead, the LP exposed them to ideas around the need for research to be communicated outside academia and guidelines for doing so. Activities involved considering audiences, identifying key messages, the principles of writing in plain language, using open licences, and the basics of translation.

Table 16 shows that, after completing the LP, respondents were more aware of communicating research outside academia, and they were better able to state potential benefits of doing so, as well as identify potential audiences.

Table 16 Ideas around releasing research communications

Questions	Baseline %	Endline %
Are you aware that you can release your research findings outside academia	74	92
Ability to state potential benefits of releasing research outside academia	62	79
Ability to state potential audiences for research released outside academia	43	83

Table 17 shows intentions of respondents. Most respondents indicated that they were likely to write their communications in plain language in the future and release the summary under an open licence, mostly CC BY. They also expressed their intention to promote their research on social media such as Twitter, Facebook and LinkedIn. About two thirds stated that they will consider translating their research into another language, usually an African language spoken in their country.

Table 17: How respondents intended to use the workshop knowledge and skills

Statements	Endline %

I am likely to consider writing my research in plain language to ensure that my audience can understand it.	88
I am likely to consider releasing my research under an open licence.	96
I am likely to consider using social media to promote my research.	88
I am likely to consider translating my research into another language.	67

T-test result

The statistical test was based on the 16 participants who completed both surveys. It analysed correct and incorrect responses to eight questions which tested knowledge and participants' intention to act on what they had learnt in the pathway.

T = 6.12

p-value = 0.00002

Effect size = 1.53

These figures indicate that the average between the baseline and endline tests is statistically significant with a large effect size, suggesting that the LP had a positive effect on participant learning.

Design for Learning I (How do we learn?) and Design for Learning II (Course Building)

While many academics are specialists in their field, very few have been trained in education theory and learning design. There is evidence that throughout sub-Saharan Africa, transmission teaching remains the dominant style, yet many universities have policies that promote a learner centred, constructivist approach that enables students to engage more actively in the learning process[12].

The aim of these two LPs is to provide guidance on how people learn (learning theory), how to design and create effective learning environments, and provide greater detail on how to structure learning (learning design) and build courses. A meta-analysis of 225 studies on undergraduate student performance in STEM subjects found that teaching approaches that encouraged active student participation rather than them being passive listeners reduced failure rates and boosted scores on examinations by almost one-half a standard deviation (Freeman et al. 2014).

Design for Learning I: How do we learn? focuses on key learning theories and their implications for teaching and learning, while *Design for Learning II: Course Building*, focuses on planning, structuring and designing effective courses.

As the two LPs complement each other, it was decided to administer them together to two universities identified by AAU during the 2021 piloting. The pilots were run with academics at a university in Tanzania (19 participants) and the other at Zambian university (30 participants).

Thirty-six participants responded to the baseline compared with 26 who responded to the endline survey. The surveys covered satisfaction of the academics with the lecture format, awareness of various learning design principles, familiarity with learning principles and theories, design

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[12] See https://www.universityworldnews.com/post.php?story=20220606121115341

approaches and models. For greater statistical accuracy, the tables below show matched pairs of baseline and endline respondents: the same individuals who completed both surveys (n=23). The surveys were coded 0 to 3 as follows: Not at all aware: 0; A little bit: 1; A fair amount: 2; To a large extent: 3. In tables 18-20, the means (averages) were calculated from these four codes.

In response to the question "To what extent are you satisfied with using the lecture format to perform your teaching responsibilities?" the academics indicated that, while 17% were dissatisfied in the baseline, this had increased to 31% in the endline survey, suggesting that the LPs had made them think about lecturing, although the majority of participants are still content with lecturing. This was corroborated by comments (copied verbatim below) from academics at the Zambian University such as:

> *After seeing the gap of just using lectures, I feel I can do more*
>
> *I am very happy because I have new methods of teaching and preparing student centered lessons. I have also learnt a lot about curriculum design*
>
> *The modules have enhanced my knowledge on how to deliver lectures*
>
> *Not satisfied (with lecturing) because lectures are not much engaging the student and it's not a student centered hence it's based on lecturer's past learning experience (how he/she was taught) in delivering learning to the learners.*

Academics at the Tanzanian university stated that:

> *I have gained knowledge which will help me to prepare learning materials for students*
>
> *I am not satisfied with the way I was teaching because I had no clue of these learning principles and design models that I learned in this course.*
>
> *I am Ok with lecture format to perform my teaching responsibilities but it needs to be complemented with other teaching methodologies to make students understand more lessons. … I am not a professional teacher. But through these two courses my knowledge has been sharpened.*

Table 18: Learning design principles

Awareness of learning design principles (n=23)	Baseline mean	Endline mean
Activity-based learning	1.9	2.5
Student-centred education	2.0	2.5
Collaborative learning	1.5	2.3
Contextually relevant learning	0.9	2.2
Incorporates technology	1.2	2.3

Table 19: Learning design approaches

Familiarity with learning design approaches (n=23)	Baseline mean	Endline mean
Behaviourism	1.2	1.8
Cognitivism	1.3	2.0
Constructivism	1.2	2.0
Connectivism	1.1	2.0

Table 20: Learning design models

Familiarity with learning design models (n=23)	Baseline mean	Endline mean
9 Events of Instruction (Gagne)	0.7	1.8
1st Principles of Instruction (Merril)	0.6	1.5
ARCS Motivational Design Model (Keller)	0.5	1.3
ADDIE	0.5	1.3
SAM	0.3	1.2

T-test results

The statistical test was based on the 23 participants who completed both surveys. It analysed correct and incorrect responses to 15 questions that tested knowledge of what they had learnt in the two pathways.

T = 8.00

p-value < 0.00001

Effect size = 1.67

These figures indicate that the average between the baseline and endline tests is statistically significant with a large effect size, suggesting that the two LPs had a positive effect on participant learning.

User experiences

A user experience survey was administered at the end of each pilot. Data from this survey and data collected at the post-pilot feedback workshops focused on aspects such as user friendliness and whether the participants found it easy to navigate through LPs. In total, 114 pilot participants responded to the user experience survey. While most of the LP assignments did not pose problems for participants, the one for Open Access Publishing was too long and complex, and was subsequently revised.

Findings in relation to the following four evaluation questions are presented below, framed using the evaluation questions listed above. Question 3 has been answered in the findings under each LP.

Evaluation question 1: Is the design of the LPs coherent and does it allow easy navigation by academics with minimum technological skills?

Over 90% of respondents stated that design of the LPs was good, user friendly, and easy to navigate. Participants found the language easy to understand and indicated that they did not encounter any technical challenges in going through the LP. A few respondents reported challenges in navigating through the LPs, that included "complexity" (no details provided), music licensing (a minor point in the context of the LPs), and navigation ("the software does not save your position once it is closed"). For the first four LPs discussed in this report, there were a total of 13 negative comments in the user experience surveys. These included the following:

- The LP was a bit complicated for them as beginners.
- Navigating through the learning pathway was not easy because in the course of finding open content, especially with regards to Image/ graphics, they found it difficult to decipher how to go about it and what to choose.
- The personal bandwidth and low network connectivity (x5) [this is not a feature of the LPs but instead the context of the users].
- Preference for page-to-page layout, rather than scrolling down.
- Challenge with activity that was not compatible with devices used.
- I didn't know that the assignment was to be written on Microsoft word until I asked my colleagues.
- It involved a rigorous process and needed much concentration and reading and re-reading to come to terms with the LP.
- Attending to other commitments interfered with completing the LP [not related to LP design].
- Couldn't complete the final assignment.

Data from the user experience surveys completed by academics who had finished the two Design for Learning Courses I and II, reflects that 88% found the content in Course I to be well sequenced, while, for Course II, it is 100%. In response to the questions related to presentation of both courses, 94% of academics stated that Course I was well presented and user friendly. For Course II, it is 82%. The following comment was made by a Zambian academic in relation to *both* Learning Design Courses.

> *The instructional technology was up to scratch. I love the graphics and the user-friendliness of the App. The content was succinct and bewitching. A course on instruction technology can further enhance our capacity. Simply, the course has been so edifying. Thank you.*

Evaluation question 2: How do participants react to the LPs in terms of their usefulness and relevance for their needs?

Most academic staff (over 90%) reported that they found the LPs useful. In the FOC LP, information on the different types of licenses, the filtering search tools, examples of universities that have open content repositories, and information on OER content databases was all reported to be of great value to the academic staff. For AOC, respondents indicated that they found the short video clips informative and helpful to understand the concepts. They also indicated that there are enough hints to guide the learner and that the language choice and examples are user-friendly. Respondents who had engaged with the POA LP reported feeling more confident about publishing in OA journals because, this was underpinned by knowledge acquired regarding the benefits of doing so. Academics who completed the two Design for Learning courses submitted a range of positive responses regarding their relevance.

I found both courses relevant because my teaching skills and lesson plans preparation have been enhanced. I have also learnt how to prepare and develop a course curriculum.

I observed that I have used principles contained in both courses unknowingly. The courses, however, present me an opportunity to approach teaching and learning design in a more methodical fashion grounded in proven frameworks.

The courses give clear steps and approaches to use when lecturing

For course 1: was really relevant as it exposes to the different modalities of learning principle which are key to the learning process and for course II: it provided the different ways to build up the course taking into account the relevant principles of learning that seem appropriate to the audience and learning environment.

The courses have been especially helpful to me especially that this is my first year as a lecturer. I would be happy to attend more courses of this nature.

Both courses were insightful. I would not mind being given more opportunities of such courses.

They are very good courses overall and would recommend them to anyone any time.

Overall, the courses were well prepared and timely offered. It will be good that you can continue offering such embedded courses to us academicians who don't have backgrounds in teaching methodologies and course development.

Evaluation questions 4 and 5: Are the LPs compelling enough to motivate academic staff to want to engage with them? What are the potential barriers to implementing this approach to professional development on a large scale?

Evidence suggests the potential of the LPs to motivate academics to want to engage with them; for example
- Some participants acknowledged that they had no education background and they found LPs on Learning Design very useful
- Participants indicated that they learnt something from the LPs and plan to use the knowledge in various ways, including revising courses on information literacy, etc
- Some participants indicated that they were:
- improving their courses on the bases of knowledge gained about searching for and integrating OER.
- using the knowledge gained to select the most suitable OA journals for the library.

The fact that for most of the LPs, T-tests showed significant change happening as a result of going through the LPs is, in itself an indicator of the benefits academics derive from the LPs. This has potential to motivate academics.

While the overall response to the LPs was very positive, respondents did raise challenges regarding implementation of an online, flexible, individual approach to CPD. The following issues were highlighted as likely to be potential barriers to implementing online LP tutorials as a professional development strategy. These include:
- Poor connectivity in some universities.

- High data costs; respondents commented on the fact that the videos in the LPs required the use of a lot of data.
- Lack of suitable personal digital devices is a barrier for some academic staff.
- Lack of dedicated time to engage with the LPs due to other commitments in the university.
- Lack of incentives to motivate academic staff to engage with this form of CPD where staff use their own time and do the LPs out of their own accord.

Surveys completed by academics who completed the two Learning Design courses also provide some reflections on the mode of provision used to implement these short professional development courses. At the Zambian university, 71% of participants, felt that these courses could be implemented both as independent study or in a face-to-face workshop context. The remaining 29% would have preferred these courses to be offered in face-to-face workshop mode. Of interest was the fact that a number of the participants felt that, ideally, the LP should be offered in a blended or hybrid mode, i.e. while dominantly online, certain aspects, such as curriculum planning and applying learning design principles, would be best done in a face-to-face context. A number of participants also highlight the lack of opportunity to discuss questions with peers or a facilitator. They felt that this would be better enabled in a face-to-face environment.

> *Face-to- face to enable people to ask questions when they have challenges especially on the assignments.*
>
> *It was difficulty to work through assignment 2 but if that was explained in a face to face session, it would have easier. Because face to face interactions allows time for questions.*

While the facilitator of both Learning Design pilots set up a WhatsApp group for each institution and strongly encouraged the pilot participants to engage with peers and with her on any issues related to the two courses, no participants chose to do so.

Participants at the Tanzanian university overwhelmingly felt that both courses should be implemented in a face-to-face context. This group had far greater connectivity challenges than the Zambian group, and had not moved to any online teaching & learning during the Covid lock down, which might explain the difference.

Specific course challenges

In response to the question regarding challenges encountered in completing the two Learning Design courses, it became apparent that a number of participants had struggled to complete the two assignments, especially the one in Learning Design Course II. Overall, participants reflected that the assignments were not well scaffolded and lacked clear instructions on how to complete them. Problems included that: links between assignment I and II were not made explicit; a number of terms used were not explained, for example, curriculum mapping and notional hours; and no guidance was provided on the scope of content to be covered (how large section of the curriculum to use in the design activity). The following comments exemplify some of the difficulties encountered.

> *For the course builder the section of filling in the template requires a more clear explanation. The contents to filled in must first be explained before attempting to fill in the template*
>
> *You require prior knowledge of teaching methods or curriculum development to understand the concepts. The tutorials assignments start at a high level instead of the basics.*
>
> *Redo the video on templates for course 2*

Second assignment the instructions were not clear on what to do.

The curriculum design template seemed tedious at the beginning, especially the exact time allocation

How the LPs were used

In the endline survey, respondents were asked open ended questions such as what they had learnt, and to describe how they were using the knowledge and skills gained in the Adapting OER learning pathway. Fifteen respondents answered this question. Examples of responses provided included the following:

What they had learnt:

I learnt the what, how and when of OER adaptation using the 5Rs: Retain , Redistribute , Revise , Reuse and Remix . With that, I have the capacity to prepare better lecture notes and research reports. I can also teach and mentor colleagues and students.

I have learnt about the process of adapting OER content, I have also learnt that resources with CC BY-ND license will not allow you to change content if you want to make it relevant to your situation and should always take heed of the licenses when i select resources for adaptation.

How they are using the knowledge and skills:

I support course lecturers who are designing and developing IDE materials by identifying relevant OER to be adapted.

I advise Instructors on how to identify Open Content and adapt it to suit their context.

I am using it when creating content for our library guides, information literacy skills tutorials and assignment calculator tool which I am currently creating.

Using the pathway to be able to source and adapt OER for teaching, research and mentorship.

We are using the Learning Pathway to help course instructors to develop learning materials (Course modules). Help them to find OERs and adapt them for their courses.

I have re-designed some of my courses and I hope to repurpose multimedia material for my courses.

I am enriching my learning materials as well as training others to access the OERs

I am teaching our students and also managing collections that are open access.

Thus, both academics and librarians reported identifying relevant OER and adapting it for teaching purposes and in some cases OER was sourced to enhance existing teaching materials.

Some participants indicated that they were already using the LPs to teach their colleagues how to use the learning pathways in order to gain knowledge and skills about adapting OER. Such peer support is a useful and more sustainable way of professional development in an institution. One respondent indicated he was revising their information literacy module based on the knowledge

gained from the LP. The following quotations are examples of how participants said they were using the LPs and the knowledge they gained:

> *I advise Instructors on how to identify Open Content and adapt it to suit their context.*

> *I am using it when creating content for our library guides, Information literacy skills tutorials and assignment calculator tool which I am currently creating.*

While the time frame for implementation of the two Learning Design courses did not allow for reflection on implementation, many of the academics reported that they would implement much of what they had learnt in these courses. Further, as evidenced in the comment below, it was also felt that the more interactive approach promoted, would impact positively on teaching and learning at universities.

> *I personally found the course very relevant and presented in a simple chunk for one to understand, it's a useful course wishing also to have a workshop for it to further my understanding. Once applied to wider coverage i believe it will have a positive impact in the higher teaching and learning process.*

Conclusions

Answers to our evaluation questions have been discussed in the sections above. The results of the baseline and endline surveys reflect that pilot participants' engagement with the six LPs mostly resulted in positive learning experiences. The results demonstrate increased knowledge and skills in most items listed. Five of the LPs showed statistically significant change between the baseline and endline tests, which suggests that learning did indeed occur. Conversely, the T-test for Adapting Open Content did not show such a result, and, although there were positive changes in many of the items, it cannot be certain that this was the result of the participants completing the LP.

The findings from the user experience survey and feedback from the post pilot Zoom discussion sessions regarding the efficacy of the design and ease of using the LPs and the relevance of the content reflect very high levels of user satisfaction and very positive results related to the relevance. The surveys and discussion also provide evidence of *change* in the academic staff's practice, which is part of Guskey's level 2 (learning) and even level 4 (use of new knowledge and skills). Many academic staff reported on ways in which they were able to implement their new knowledge and skills related to finding and using OER both for teaching and for research, thus underscoring the positive value of the LPs in building the capacity of academic staff to strengthen the quality of their teaching.

Responses highlighted some barriers to using the LPs. Unsurprisingly, this included issues of connectivity, access to digital devices and the high cost of data. This highlights the digital divide in sub-Saharan Africa even among university lecturers that has been especially evident during the Covid-19 pandemic. The need for improved connectivity, devices and data is becoming ever more paramount, so governments, institutions and the international community need to consider solutions to such critical issues[13].

Another issue raised as a potential barrier by academic staff and librarians was the lack of dedicated time in which to engage with the learning pathway activities. This concurs with time as a barrier faced by academics worldwide (Inamorato dos Santos et al 2019a), and some comments by

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[13] National research and education networks (NRENs) are attempting to improve speed and stability of connectivity to the universities. Some of the problems are due to poor campus infrastructure, with (e.g.) not enough hotspots. Such issues need to be taken seriously at all levels.

respondents imply that there was no acknowledgement of this sort of CPD as it occurred in a personal space (and was therefore "unseen") as opposed to the workshop context, which could easily be seen and one's participation in CPD, witnessed, "by the powers that be". OER Africa has experienced this problem anecdotally in other activities (e.g. OER champions vs writing research for publication).

In line with Guskey's (2000) framework, the results of the piloting show that participants reacted positively to all six LPs. They found the LPs appealing in terms of their design, relevance, and appropriateness as CPD resources. New techniques and skills that participants learnt by going through the LPs include appropriate identification of types of licenses under which various resources are published, and how the resources should be used, searching for resources relevant for their disciplines and how to adapt and integrate OER meaningfully in their courses. Those who engaged with the POA seemed to have gained greater appreciation of the value of publishing using open access, and gained good understanding of the disadvantages of using predatory publishers, especially the value and credibility of their research. We can therefore confidently state that there were learning gains. What we would like to know in future work is whether the learning gains have resulted in tangible benefits

In their post-pilot feedback, some indicated that they had started thinking of how they would use the LPs and the knowledge they gained therein. Some mentioned improving their courses on the bases of knowledge gained about searching for and integrating OER. Others mentioned using the knowledge gained to select the most suitable OA journals for the library. Knowledge gained by going through the POA was going to be used to enhance the respondent's Information Literacy course. This suggests that Guskey's level 4 was achieved by at least some participants.

Guskey's impact level 3 refers to changes that occur in the organisation to support CPD initiatives. Although the piloting period was short and the participating groups too small to influence such organisational changes, there was some evidence during the feedback session discussions that participants could identify enabling conditions for the piloted approach to take root, such as a greater acknowledgement by management, of staff participation in CPD.

From a methodological perspective, future evaluation of academics and librarians participation in learning pathways or similar CPD activities would need a longer period for data collection, and include whether the LPs resulted in changed practices and improved performance by students taught by academics. Groups such as academics and librarians would need to be examined separately to tease out how CPD affects them, given their different roles in universities. Finally, efforts to obtain larger samples in baseline and especially endline surveys would provide more robust findings.

Recommendations

It is important to reflect on what implications the findings of the research might have for CPD in HEIs. First, future CPD cannot be 'business as usual'; there is a need for quality innovative professional development for staff in ways that they can access. One of the findings from the experience of OER Africa and from the literature, was that there are several barriers to academic staff engaging in CPD, including a lack of time, the absence of inducements and reluctance to depart from existing practices (Inamorato dos Santos et al 2019b). The evaluation identified the former two barriers in the survey and discussions. Part of the rationale for creating the LPs was to provide short, easily completed online CPD activities which participants could learn from. The findings suggest that the LPs initiative was at least partly successful in doing so. However, it is clear that institutions need to take teaching development seriously and provide both time for staff to engage in it, as well as possible extrinsic motivation to do so. Ideally, intrinsic factors should be more important, and institutions and the field need to create conditions for effective CPD to thrive. Institutions also need

to consider clear strategies for their CPD which take into account the barriers their staff face and how new models of CPD can be implemented.

To mitigate the barriers, an enabling institutional policy environment would need to be created. One option is to have CPD linked to institutional human resource policy. Currently, there is recognition of publication output but not necessarily CPD of staff, especially when done privately. This practice tends to encourage staff to do research and publish at the expense of other important undertakings, like CPD and teaching. The AfLIA group stressed the need to have independent CPD linked to promotion and remuneration policies of the university. This, coupled with management support, are likely to be positive factors in making the approach exemplified in the LPs initiative successful.

References

Freeman, S., Eddy, S., McDonough, M., Smith, M. Okoroafor, N., Jordt, H. & Wenderoth, M. (2014). Active learning boosts performance in STEM courses. *Proceedings of the National Academy of Sciences* 111 (23) 8410-8415; DOI: 10.1073/pnas.1319030111. Available at https://www.pnas.org/content/111/23/8410/tab-article-info

Health Foundation, (2011) Improvement Science. Available at https://www.health.org.uk/sites/default/files/ImprovementScience.pdf

Inamorato dos Santos, A., Gaušas, S., Mackevičiūtė, R., Jotautytė, A., Martinaitis, Ž. (2019a) *Innovating Professional Development in Higher Education: An analysis of practices,* EUR 29676 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-00580-3, doi:10.2760/26224.

Inamorato dos Santos, A., Gaušas, S., Mackevičiūtė, R., Jotautytė, A., Martinaitis, Ž. (2019b) *Innovating Professional Development in Higher Education: Case Studies*, EUR 29669 EN, Publications Office of the European Union, Luxembourg, doi:10.2760/712385.

James Jacob, W., Xiong, W. & Ye, H. (2015) Professional development programmes at world-class universities. Palgrave Commun 1, 15002.

Niedderer, H., & Goldberg, F. (1995). LEARNING PATHWAY AND KNOWLEDGE CONSTRUCTION. In *Vol. University of Leeds, European Conference on Research in Science Education*.

Porritt, V (2012) *Making a difference: a practical approach to evaluating the impact of professional development.* Available at https://tdtrust.org/making-a-difference-a-practical-approach-to-evaluating-the-impact-of-professional-development