A contribution towards innovating Continuing Professional Development in African Higher Education Institutions.

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Introduction

The COVID-19 pandemic has brought the importance of professional development on effective teaching and learning for university academics into sharp relief. As has been reported in numerous publications during 2020 to 2022, universities found themselves having to close their campuses and unable to teach their students face-to-face. Whatever form the teaching has taken, academics have found that traditional lecturing has not been effective when implementing Emergency Remote Teaching or online teaching. The lecture mode of teaching has been regarded as inadequate for the last few decades (e.g. Jones, 2007; Khan, 1997), and the pandemic has brought this into sharp relief.

A 2019 report by the European Union (EU) on CPD suggests that there are three drivers for the increasing necessity for CPD in higher education, namely the massification of HE, the digitalization of HE and the value of professional success for individual academics (Inamorato dos Santos et al 2019). The report also notes that, despite these drivers, academics rarely participate in CPD practices due to several inter-related 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; possibly the key factor (King, 2004).
- HEIs' lack of pedagogical expertise and institutional capacity to develop effective CPD schemes.

Traditional CPD has tended to focus on lecture-style inputs, and is regarded in the EU report as ineffective because there is often little relationship between the training and academics' classrooms and students. One way to mitigate these challenges is to provide short, online tutorials that engage participants in authentic learning tasks that can be done individually or collaboratively in their own time, while they are in the workplace. This paper describes the development and piloting for three of OER Africa's learning pathways: finding and adapting OER, and Open Access Publishing.

Developing and Piloting the CPD learning pathways

In 2019-21, OER Africa developed a series of innovative professional development learning pathways (LPs) for academic staff and librarians in HEIs in Africa. The standalone online LPs consist of short tutorials that engage participants in authentic learning tasks that can be done individually, collaboratively, or in a workshop environment. Academics can engage with the LPs using various devices such as computers, tablets, and smartphones, but require an 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. The LPs are aimed at enabling academics to improve their teaching and learning capacities, using OER, to provide a better-quality learning experience for their students. The LPs developed and published,[1] focus on relevant, contextualized practical skills and knowledge development concerned with teaching and learning, and to a lesser extent research, at higher education level.

The piloting of learning pathways was intended as an action research exercise from which the OER Africa team systematically drew lessons from experience for CPD development and for the field. Since the project intervention is a professional development initiative, the action research was informed by Guskey's levels of CPD impact evaluation (Porritt, 2012). These are: participants' reactions; participants' learning; organisational support and change; participants' use of new knowledge and skills; and student learning outcomes. We chose to limit ourselves to the first four levels only due to the limited project 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.

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[1] See https://www.oerafrica.org/book/learning-pathways-open-education-online-tutorials

Identification of pilot institutions and participants

Seventy-eight 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 conceptualized. 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. In three of the universities, pilot participants were recruited from distance education units within the institutions. Some pilot institutions only focused on one LP while others worked through more than one. However, data collected in the endline[2] survey was limited, suggesting that not all those who planned to complete more than one pathway actually did so.

Administration of the pilots

The following three LPs were piloted:
1. Finding Open Content
2. Adapting Open Content
3. Publish Open Access

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

Institutions	Finding Open Content	Adapting Open Content	Publish Open Access
Universities in Botswana, Eswatini, Ghana, Namibia, Nigeria and Uganda	52	51	42

*Although we received participant lists from the universities, it is not clear that all participants actually completed all the learning pathways listed here. See Table 2.

Before participants engaged with the LP, they were introduced to the resource through a video-conferencing meeting (using Zoom). The developer 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 at least one week to go through the LP individually. The participants then completed a user-experience survey and joined a Zoom feedback meeting. Given that not all participants managed to complete the LP(s) within a week, they were allowed to engage with them for 2-3 months. 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. The respondent data is shown in Table 2. Space constraints do not allow us to report on all of the items in the survey or the qualitative comments made by participants in free choice sections or the Zoom feedback sessions.

Table 2: Respondent data

Learning Pathway	Baseline	Endline	Paired t-test	Statistically significant
Finding open content	51	18	n = 14 T = 2.96 p = 0.011 D = 0.79	Yes
Adapting open content	39	16	n = 11 T = 0.69 p = 0.504 d = 0.21	No
Publish open access	35	13	n = 10 T = 3.54 p = 0.006 d = 1.12	Yes
Total	125	47		

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[2] We use the terms baseline and endline for the pre- and post-pilot surveys respectively

Limitations

Given the variation in the number of baseline respondents compared with the number of participants that completed the pilot and the end line baseline, group percentage analysis was done to ensure that the analysis of the data was comparable. This was clearly a shortcoming, so we also conducted paired t-tests for the same individuals who completed both surveys. 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.

Participation in the pilot was voluntary, which resulted in institutions opting to do different LPs. As highlighted above, some chose to do all the three whilst others chose to do only one. Also, not everyone who completed the baseline survey for a particular LP completed the end line survey for the same LP.

The other limitation of the study is that the piloting group was a mixture of academics and librarians working in universities. We did not separate these two groups in our analysis of the results as we were informed that most librarians were academics in their own right, with broadly similar kinds of qualifications.

Findings
Finding Open Content

The aim of the Finding Open Content learning pathway is to equip academic staff with necessary skills to search for open content; familiarize themselves with the various Creative Commons licenses; 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 licenses, searching for OER, evaluating OER and participants' prior engagement with and proficiency in using OER. Here we provide findings for two of the sections: searching for and evaluating OER.

Searching for OER

Participants were introduced to the use of various search engines like Google Advanced Search, YouTube Creative Commons filter and Creative Commons Search to provide them with enhanced capacity for 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 staff to carry out more effective OER searches in the future. In a related question academic staff were required to indicate which of the advanced search tools they had used before and after the pilot.

Table 3: Tools used to search for open content

	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 3 show a significant increase in the use of YouTube, Creative Commons search tools, and Google Advanced Search in the endline survey. In the baseline survey, 26.5% of respondents reported that they had a favourite educational content repository they preferred their students to use. In the endline survey, this figure had increased to 33%.

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 academic staff 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 reported in Table 4.

Table 4: 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 4 shows an increased use of defined criteria and reduced use of one's own discretion for evaluation of OER suitability in the endline data. This suggests that academic staff adopted a 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 criteria for evaluating OER, that were provided in the LP.

The t-test results 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 learning pathway is to equip academic staff with the knowledge and skills that are necessary for adapting OER to suit particular contexts. Sections of the surveys covered understanding adaptation and the licenses that permit adaptation and repurposing, attribution, considerations involving revising and remixing, understanding the 5Rs and understanding what changing a resource entails. Here we provide findings for two of the sections: understanding attribution and understanding the 5Rs.

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 5 shows survey results of these two questions in the baseline and the endline survey.

Table 5: 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 5 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 the 5Rs (Remix, Retain, redistribute, Revise and Reuse)
Respondents were asked to match each of the terms with the correct description given in a matrix (table 6)

Table 6: Comparison of correct understandings of 5Rs

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

Results in Table 6 show increased understandings of what Remix, Redistribute, and Reuse mean in the end line compared to the baseline survey. It is not clear why understandings of Retain and Revise show lower percentages in the end line compared to the baseline data.

The t-test results 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.

Publish Open Access

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. Here we provide findings for the understanding of open access licensing conditions and the ability to identify reputable journals.

Basic understanding of Open Access Publishing licensing conditions

Table 7 shows that, at the baseline, the majority of 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% in the endline survey were able distinguish between traditional and open access publishing in respect of rights related to content adaptation. The results of the endline survey do, however, reflect an improvement in the respondents' understanding of the licensing conditions.

Table 7: 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

Identifying reputable open access journals and publishers

The baseline survey indicated that most 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 respondent's ability to identify key factors to take into consideration (Table 8).

Table 8: 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.

The t-test results 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.

Discussion

The results suggest that pilot participant's engagement with the three OER LPs mostly resulted in positive learning experiences, including increased knowledge and skills in most items listed. Two of the LPs, Finding Open Content and Publish Open Access, 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 was positive changes in many of the items, we cannot state that this was the result of the participants completing the LP.

In line with Guskey's (2000) framework, the results of the piloting show that participants reacted positively to all three 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 Publish Open Access LP seemed to have gained greater appreciation of the value of publishing using open access. At the same time, they gained good understanding of the disadvantages of using predatory publishers. 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.

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 Publish Open Access 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.

It is important to reflect on what implications the findings of the research might have for both CPD policies and processes in African HEIs. First, future CPD cannot be 'business as usual' in HEIs; there is a need for quality innovative professional development for staff in ways that they can access. The literature suggests 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 (e.g Inamorato dos Santos et al 2019). We identified the former two barriers in our 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. Our findings suggest that we were 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. In the longer term, intrinsic factors would be as, or more, important, and institutions and the field need to create conditions for effective CPD to thrive. Institutions also need to plan clear strategies for their CPD which consider the barriers their staff face and how new models of CPD can be implemented.

A number of potential studies for the African continent emanate from the research: an analysis of motivating factors for staff involvement in CPD; a survey of CPD practices; a multi-institution study to determine the effectiveness of innovative CPD practices; a study of the impact of CPD on academics' career development and institutional culture. To make a difference to teaching and learning across the continent, we recommend that institutions adopt CPD models that can address large numbers of staff at a time. Short, flexible, online engagements such as the OER Africa learning pathways are one way to achieve this, but incorporated into a more substantial CPD model or strategy. To enable Guskey's impact levels 4 and even 5 (student learning outcomes), substantially greater efforts need to be taken to improve teaching and learning in all HEIs: face-to-face, distance and hybrid.

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