



Case Studies on the Impact of the COVID-19 Pandemic and the Responses from West African Universities

Final Report

Pauline Essah
Laté A. Lawson
Samuel Asare
Krista Cecille Samson
Samuel Agyapong

Education Sub Saharan Africa

Severin Konin

Université Félix Houphouët-Boigny
(Côte d'Ivoire)

Might Kojo Abreh
Clara Araba Mills
Gloria Nyame
Georgina Yaa Oduro
Dorothy Takyiakwaa
Theophilus Odame Danso

University of Cape Coast
(Ghana)

About the report

This report was prepared by Education Sub Saharan Africa (ESSA) in partnership with the Université Félix Houphouët-Boigny (UFHB), Côte d'Ivoire, and the University of Cape Coast (UCC), Ghana.

About ESSA

ESSA is a charity founded in 2016. Our vision is high-quality education that enables young people in sub-Saharan Africa to achieve their ambitions and strengthens society. ESSA's mission starts with universities and colleges. Driven by the needs of young people, we join up leaders (e.g. educators, funders, policymakers) and provide them with the data and evidence they need to make good decisions and to change the system. ESSA offers:

- a strong, predominantly African team and board based in Africa and Europe, blending experience in research, mapping, knowledge management, advocacy, and communication;
- a unique position in African tertiary education, via a proven track record in researching important educational issues in sub-Saharan Africa, and delivering practical and innovative solutions;
- well-established research and dissemination partners and networks for tertiary education (e.g. the [Ghana Tertiary Education Commission](#), [Decent Jobs for Youth](#), the [Association of African Universities](#), the [Inter-University Council for East Africa](#), [Zizi Afrique Foundation](#), [UNESCO](#), [UNHCR](#), [Université Félix Houphouët-Boigny](#), the [University of Cape Coast](#), and [Quilt.AI](#), among others); and,
- strong values that guide everything we do. We are evidence-driven, solutions-focused, we strengthen trust, and we are always learning.

For further information, please contact Dr. Pauline Essah at pauline@essah-africa.org or Dr. Laté Lawson at late@essa-africa.org.

Acknowledgements

We are grateful to Dr. Lucy Heady (ESSA), Prof. Michel Carton (NORRAG), and Prof. George Oduro (UCC) for their support and useful comments and suggestions which helped improve the quality of this document. We are also grateful to Prof. Zié Ballo (UFHB), Prof. Abdoulaye Sangare (UFHB), and Dr. Fofana Mustapha for their support and help at diverse stages of this project. Finally, we would like to express our deep appreciation to UFHB PhD candidates Kouakou Vika Maria D., Assery Kangah Diaz, Kouakou Adja Angèle, and Soh Awa Tchieriginimin for their assistance in the data collection process.

Contractor: IDRC

Grant Number: 109691–002

Contracting period: 05 August 2021 to 04 December 2021

Contents

Executive summary	iii
Glossary	vi
1 Introduction	1
2 Lessons from existing scholarly knowledge	2
2.1 COVID-19 and HE: A global perspective	5
2.1.1 COVID-19, teaching and learning: Opportunities and challenges	5
2.1.2 COVID-19, research, and researchers: A global perspective	7
2.2 COVID-19 and HE: The African perspective	9
2.2.1 COVID-19 and research resources in (West) African HEIs	10
2.2.2 COVID-19 and geographical mobility in (West) African HEIs	10
2.2.3 COVID-19, recruitment and career progression	12
2.2.4 COVID-19, research culture, and outputs in (West) African HEIs	13
3 Methodology	13
3.1 Data collection instruments	14
3.2 Data analysis	14
4 Project outputs	15
4.1 UFHB and UCC: a brief description	15
4.1.1 COVID-19, research, and researchers at UFHB and UCC	15
Sample description	15
COVID-19 and research funding	17
COVID-19 and research mobility	19
COVID-19, career progression, and recruitment	20
COVID-19, research culture, and output	23
A gender perspective	26
5 Problems and challenges	28
6 Overall assessment, recommendations, and evidence gaps	29
6.1 Overall assessment	29
6.2 Recommendations	30
6.3 Evidence gaps and future research opportunities	32
References	33

Executive summary

The Coronavirus (COVID-19) outbreak has caused various levels of disruptions in education and research. Reviews of COVID-19-related research in high-income countries show that the more a country is hit by the pandemic, the more effort it devotes to research. In developing countries, especially African countries, very little research can be identified on the impacts of the COVID-19 pandemic. This report contributes to existing knowledge by providing case studies about the impact of the COVID-19 pandemic on two West African universities and how these universities are responding. Specifically, we assess how COVID-19 has affected research resources, geographical mobility, career progress, research collaboration, training, and institutional support at the Université Félix Houphouët-Boigny (UFHB, Côte d'Ivoire) and the University of Cape Coast (UCC, Ghana). In doing so, we reviewed related literature and exploited data collected through online surveys, focus group discussions, and interviews targeting doctoral students and faculty members/heads.

Lessons from literature

Reviewing studies related to COVID-19 and research reveals that although a growing body of literature is devoted to assessing the impacts of the COVID-19 pandemic in other geographic areas, very few empirical studies target West Africa, whether this concerns the effects of COVID-19 on education, the education system, the job market, research, or researchers. Overall, the rare studies identified show that:

- COVID-19 has exacerbated the existing scarcity and inequality in resource distribution in West African universities;
- the pandemic has caused a reduction of financial aid to research institutions;
- COVID-19 restriction measures have affected West African researchers' national and international mobility and weakened existing collaborations and partnerships;
- COVID-19 has affected career progression of academics, especially early career researchers; and,
- African Higher Education Institutions are among those most affected by the measures to deal with the pandemic, especially cuts in research funding.

Main results

Primary data collected from the two Higher Education Institutions (UFHB and UCC) helped deepen our understanding of the impact of COVID-19 on research, researchers, and institutional support. Analysing the data reveals that:

- for most researchers at UHFB and UCC, 58% and 61% respectively, COVID-19 has caused a decrease in research funding, which is largely from private sources;
- the pandemic has negatively impacted academic mobility. However, the severity of the impact of COVID-19 on academic mobility has decreased over time;

- UFHB and UCC academics being public servants (i.e. on permanent contracts) may explain why respondents largely reported no changes in career advancement or termination. Nevertheless, 64% and 50% of academics at UFHB and UCC, respectively, reported a decrease in their career progression opportunities;
- at UFHB, the share of researchers with one publication per year has increased since the pandemic began, while the proportion of researchers with more than three publications per year has decreased. Interestingly, in the case of UCC, an overall decline is observed in research outputs since the COVID-19 pandemic;
- for most respondents, 77% of UFHB and 45% of UCC academics, their research collaborations have deteriorated as a result of the COVID-19 pandemic;
- contrary to UFHB, where there seems to be no gender bias in the responses, at UCC, most male researchers (80%) disagree that there were gender effects of the pandemic, while most female academics (60%) report that the pandemic was experienced differently by male and female researchers; and,
- very limited institutional support has been provided to academics in the two West African universities we focused on (UFHB and UCC).

Challenges

Some challenges were encountered during the data collection process for these case studies. As examples, the research began in August 2021, when the university staff were officially on vacation. This made it difficult to meet with researchers, coupled with existing COVID-19 security measures, as well as a university staff strike action at UCC that interrupted institutional operations. These factors, which had an impact on response rates, prompted us to rely heavily on online surveys, with a non-probability sampling approach, although we were aware that a higher response rate was required for statistical power. The qualitative data collected provides excellent insight into our individual research questions. However, such data can also suffer from intrinsic biases such as sample bias, subjectivity, bias in the interpretation of questions, among others. In addition, the nature of the data and hence our analysis have some inherent limitations such as sample bias and subjectivity.

Overall assessment

Our analysis revealed that the COVID-9 pandemic has had an impact on research activities, mobility, funding, collaboration at both UFHB and UCC. In addition, the researchers reported very limited institutional support, with respect to fieldwork, capacity building, Information and Communications Technology training, and the availability and processing of funding to conduct research. Furthermore, regarding gender, academics from both West African universities mostly agreed that pre-existing gender inequalities remained unchanged during the pandemic.

Recommendations

The recommendations arising from this research reflect the findings and suggestions by respondents and can be classified into three categories: capacity building, infrastructure, and research funding. Specifically:

- West African university leaders (and policymakers) need to increase investment in research, including for procuring research materials and laboratory equipment;
- West African university decision-makers should consider introducing financial incentives to promote a research culture for contributing to world knowledge; and
- for international development agencies and research funders, local dissemination of ‘calls for proposals’ and ‘less stringent requirements’ for accessing research grants are needed to help West African researchers to be aware of and to understand research project funding mechanisms. Also, besides regular calls for proposals, the provision of ad hoc funding for promising research projects will help the researchers to propose and conduct more innovative, tailor-made and timely research.

Finally, by reviewing existing COVID-19-related literature on higher education, and based on the findings from the two case studies conducted, this report identified some evidence gaps in sub-Saharan Africa, which represent opportunities for future investigations. Among others, assessing the impact of the COVID-19 pandemic on the school-to-work transition in African countries, especially in West Africa, seems opportune from both research and policy perspectives.

Glossary

COVID-19	Coronavirus Disease 2019
ESSA	Education Sub Saharan Africa
HE	Higher Education
HEIs	Higher Education Institutions
IAU	International Association of Universities
ICT	Information and Communications Technology
IDRC	International Development Research Centre
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SSA	Sub-Saharan Africa
UCC	University of Cape Coast, Ghana
UFHB	Université Félix Houphouët-Boigny, Côte d'Ivoire
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
US NIH	US National Institutes of Health
WA	West Africa
WHO	World Health Organization

1 Introduction

The SARS-CoV-2 virus that causes the coronavirus disease 2019 (COVID-19) was declared by the World Health Organization (WHO) to be a pandemic on 11 March 2020. The pandemic has affected every aspect of modern life, forcing societies to adapt to a global health crisis. To slow down the transmission of the virus, the WHO and national ministries have suggested measures, among others, wearing a properly fitted facemask and physical distancing, which has led to lockdowns and several restriction measures. Among the restrictions are the closure of Higher Education Institutions (HEIs), research laboratories, and limits to national and international geographical mobility, all of which have impacted research and researchers. As a result, many researchers are assessing the impact of COVID-19 on teaching/learning, HEIs, and research in different geographies. This study aims to contribute to scholarly knowledge on the topic by focusing on the case of two West African universities.

Considering existing work, for instance, on COVID-19 and working hours, literature reports that 60% of researchers in the United Kingdom have seen increases in their working hours during the pandemic (Vitae, 2020), while a study by Tagliafico et al. (2021) reports an important increase in the number of hours spent on research during the COVID-19 lockdown in Italy. Regarding finances, there is also evidence of a shift in research priorities and funding, leading to an increase in resources devoted to health sciences, especially emerging infectious diseases (NIH, 2020; Radecki & Schonfeld, 2020). Moreover, focusing on COVID-19 and mobility, existing evidence shows that travel restrictions and lockdowns have severely impacted research collaboration and physical attendance of conferences (EURAXESS, 2020).

Surprisingly, in the case of countries in sub-Saharan Africa (SSA), specifically in West Africa, high-profile empirical analyses focusing on the effects of COVID-19 on research and researchers are very scarce. This is particularly true for topics relating to the impact of COVID-19 on higher education and the responses from local universities. The IDRC is considering advertising a call/request for proposals for funding to support HEIs in Africa to adapt to the impact of COVID-19. To ensure that this call is properly designed to address local needs, the IDRC commissioned this study, to provide insight into current impacts of COVID-19 and responses from HEIs in West Africa. Therefore, this document focuses on two case studies about the impact of COVID-19 on HEIs in the region and the responses of these HEIs to the pandemic.

This study specifically proposed to:

- **identify how COVID-19 is affecting the distribution of research resources;**
- **investigate the effects of COVID-19 on the geographical mobility of researchers - both faculty members and graduate students;**
- **explore the potential effects of COVID-19 on recruitment and career progression of faculty members;**
- **determine how COVID-19 is affecting the research culture (collaboration, training and institutional support) and output in the selected universities.**

To achieve these goals, firstly, we reviewed existing literature on the effects of COVID-19 on the distribution of research resources, geographical mobility, career progression, research collaboration, training, and research output. Secondly, due to time and resource constraints for the project, our analysis focused on case studies from the University of Cape Coast (UCC) and Université Félix Houphouët-Boigny (UFHB), rather than study all universities in West Africa. Based on a population of heads of faculties, faculty members and PhD students at both universities, we collected and analysed qualitative and quantitative data (group discussions, interviews and surveys) to ensure in-depth and varying perspectives of evidence that would improve the accuracy and quality of conclusions.

The expected outputs of these case studies were straightforward. In addition to providing an update on the state of the actual knowledge on the subject, this analysis was expected to generate new evidence about how COVID-19 is affecting West African universities in terms of research resources, output, and collaboration, as well as career progression, geographical mobility and research culture. This was expected to help the selected universities (UCC and UFHB) to have a better understanding of how the pandemic is impacting research activities and hence, develop appropriate responses. In addition, similar institutions in West Africa could use the findings of this research to inform how they respond to the pandemic and plan appropriately for the future.

This document presents findings based on available scholarly knowledge and data collected at UCC and UFHB, regarding the impact of COVID-19 on research and researchers in these two institutions. It is organised as follows. After this Introduction, Section 2 reviews lessons from existing literature. Section 3 describes our methodological approach. Section 4 presents findings resulting from our data analyses, while Section 5 discusses challenges surrounding this research. Finally, Section 6 presents an overall assessment, draws some recommendations, and highlights evidence gaps for future COVID-19 related studies in the West African universities and countries.

2 Lessons from existing scholarly knowledge

This study, as previously mentioned, aims to understand the impact of COVID-19 on West African higher education and research. Regarding the scholarly knowledge on the topic, a fast-growing multi-disciplinary literature can be identified, among others, on teaching/learning (Adedoyin & Soykan, 2020; Bokolo, 2021), economic outputs and well-being (Apergis & Apergis, 2021; Mahmud & Riley, 2021), (gender) inequality (Ali, Miqdad, & Saverio, 2020; Dang & Viet Nguyen, 2021; Doyle, 2020), domestic violence (Fornari et al., 2021; Sánchez, Vale, Rodrigues, & Surita, 2020) (mental) health (Nurunnabi, Almusharraf, & Aldeghaither, 2020; Pfefferbaum & North, 2020), and on climate change (Fuentes et al., 2020; Heyd, 2021).

Our search strategy consisted of exploiting a multidisciplinary database, Web of Science, and searching for relevant research works using keywords. Thus, in relation to our research objectives, we mainly used the following keywords: ‘COVID-19, research, and research resources’, ‘COVID-19 and geographical mobility’, ‘COVID-19, recruitment and career’, ‘COVID-19,

research collaboration’ and ‘COVID-19 and research outputs’. Next, we narrowed down the search results to focus on contributions relevant to our research interest. Therefore, in addition to a subsection discussing COVID-19 and education in terms of challenges and opportunities, we reviewed the scholarly knowledge in the African context, as aligned to our research questions.

Our findings are presented in five main subsections and Table 1 below provides an overview of the building blocks of the literature review, as well as key lessons we identified.

Table 1: A synopsis of the literature review

Subsections	Description	Key messages and take-aways
COVID-19 and education: A global perspective	Subsection 1 provides insights into the existing literature on the impact of COVID-19 on HE, from a global perspective. It discusses the impacts of COVID-19 in terms of both challenges and opportunities. It also discusses the literature related to our research priorities in a non-African geography.	Although COVID-19 has disrupted education, it has also brought some learning opportunities by forcing societies to experiment remote teaching/learning. The studies investigating students' drop-out due to COVID-19, the quality of emergency remote learning, as well as how COVID-19 affects learning outcomes, are very scarce.
COVID-19, research, and research resources distribution in (West) African HEIs	Subsection 2 focuses on the impact of COVID-19 on research and the distribution of research resources in Africa, considering West African countries specifically. Its goal is to provide an overview of existing knowledge related to the first research question: How is COVID-19 affecting the distribution of research resources?	COVID-19 has exacerbated the existing scarcity and inequality in research resource distribution in Africa. In addition to the closing of research laboratories and libraries that have affected access to research materials, a reduction of financial aids to research institutions is noted.
COVID-19 and researchers' geographical mobility in (West) Africa	Subsection 3 focuses on the impact of COVID-19 on researchers' geographical mobility. It focuses on studies analysing the (West) African context. Its goal is to present an overview of existing knowledge related to the second research question: What are the effects of COVID-19 on geographical mobility?	As elsewhere, lockdowns and COVID-19 related restriction measures have affected African researchers' national and international mobility and weakened existing partnerships. However, compared to other geographies, a shift from physical to virtual mobility seems to be the most difficult in the African region.
COVID-19, recruitment, and career in (West) African HEIs	Subsection 4 identifies and reviews scholarly knowledge on the impact of COVID-19 on recruitment and career progression. It focuses on studies on the (West) African context with the goal of reviewing existing knowledge related to the third research question: what are the potential effects of COVID-19 on the recruitment and career progression of faculty members?	The reduction in revenue, especially in private HEIs that rely mainly on tuition fees, affected their ability to recruit new and keep existing academics. Studies suggest a potential effect on career progression of academics, with early career researchers and those with care responsibilities most affected.
COVID-19, research culture and outputs in (West) African HEIs	Subsection 5 discusses existing literature on COVID-19 and research culture and output in (West) African HEIs. Its objective is to provide an overview of the scholarly knowledge related to the fourth research question: How is COVID-19 affecting the research culture (collaborations, training, and institutional support) and output in the selected universities?	There is a general surge in research outputs in response to the pandemic but the contribution from Africa has been very low. African HEIs are among those most affected by the measures to deal with the pandemic, especially cuts in research funding from governments and international agencies and foundations.

2.1 COVID-19 and HE: A global perspective

2.1.1 COVID-19, teaching and learning: Opportunities and challenges

The early literature on the impact of COVID-19 on education by [Adedoyin and Soykan \(2020\)](#); [Liang, da Costa Junior, and Piumarta \(2020\)](#); [Marinoni, Van't Land, and Jensen \(2020\)](#) and [Daniel \(2020\)](#) among others, focused on how the pandemic has affected teaching, learning and assessment. Indeed, since lockdowns and physical distancing were encouraged as a solution to curb the spread of the virus, many schools, colleges, and universities suspended face-to-face teaching and learning. Among other measures to sustain education was the switch to online or emergency remote teaching and learning ([Bozkurt & Sharma, 2020](#); [Pokhrel & Chhetri, 2021](#)). On April 1 2020, the shutting down of schools and HEIs due to COVID-19 affected almost 1.5 billion students and youth [UNESCO \(2020\)](#).

Analysing changes that occurred in the global educational system during the pandemic, researchers largely distinguish between online education and emergency remote teaching ([Adedoyin & Soykan, 2020](#); [Golden, 2020](#)). The latter is temporary and refers to emergency responses in situations like the COVID-19 pandemic, where societies are forced to use alternative strategies to sustain education. Online education, however, is a complex process that requires careful planning in order to create an effective learning ecosystem ([Bozkurt & Sharma, 2020](#)).

Overall, besides holistic considerations on lessons learnt, the pros and cons of online education and the importance of technology in times of pandemic like the COVID-19, the literature reveals that teaching and learning during the COVID-19 pandemic can be analysed through the prism of opportunities and challenges. Concerns over synchronous or asynchronous teaching and learning were also highlighted. Without being exhaustive, we report below some of these opportunities and challenges, focusing on (higher) education during the COVID-19 pandemic.

Opportunities

The COVID-19 pandemic has paved the way for teachers to teach and consequently students to learn anywhere and anytime (i.e. flexibility in time and location), since digital technology is increasingly becoming an essential part of the teaching and learning experience ([Liang et al., 2020](#)). Although the pandemic provided most educational institutions with an opportunity to introduce and experience digital learning platforms ([Kaup et al., 2020](#)), the preparedness and confidence of both instructors and learners, depending on disciplines, remain questionable ([Watermeyer, Crick, Knight, & Goodall, 2021](#)). Nevertheless, for [Marinoni et al. \(2020\)](#) and [Neuwirth, Jović, and Mukherji \(2020\)](#), even this unplanned and unprepared transition to remote teaching/learning has fostered capacity building of staff, as both instructors and learners have learned and tested new tools and systems to sustain education. Furthermore, the abrupt transition has presented a unique opportunity for faculty to 're-envision and re-imagine' teaching, and for students to acquire some very important educational and professional skills they may heretofore have not considered ([Doucet et al., 2020](#); [Neuwirth et al., 2020](#)).

Positive notes encountered in existing studies also include the strong connection observed among teachers, parents, and between teachers and parents during the pandemic than ever before. For [Doucet et al. \(2020\)](#) and [Pokhrel and Chhetri \(2021\)](#), COVID-19 offered incomparable opportunities for cooperation, creative solutions, a willingness to learn from others, and to try new tools to improve online teaching and learning. Finally, besides the availability (online) of teachings by experts from all over the globe ([Kaup et al., 2020](#)), it is noted that online learning behaviour of the students has a positive effect on their future learning outcomes ([Hsiao et al., 2019](#)) and also that online learning modes are cost effective ([Khan & Abid, 2021](#)).

Challenges

COVID-19 is the greatest challenge that the global education system has ever faced ([Daniel, 2020](#)). It has provoked an unexpected shift to online teaching environments, giving little time for instructors to suitably prepare ([Kalloo, Mitchell, & Kamalodeen, 2020](#)). Such a rapid shift has presented challenges for both instructors and students.

For instructors, a cross cutting concern identified in most studies was their (in)ability to cope with the abrupt migration from face-to-face to emergency online teaching due to COVID-19 ([Almazova, Krylova, Rubtsova, & Odinkaya, 2020](#); [Chand, Lal, & Chand, 2021](#); [Molchanova, Kovtoniuk, & Savych, 2020](#)). In a case study on the HE system in Russia, [Almazova et al. \(2020\)](#) identified ‘instructors’ readiness’ for online pedagogy and their ‘computer literacy level’ as key barriers to the abrupt transition to online teaching. A similar observation was made in other countries such as Trinidad and Tobago, for example in studies by [Kalloo et al. \(2020\)](#) and [Khan and Abid \(2021\)](#), where teaching staff struggled to convert existing face-to-face teaching materials into online formats during the pandemic, necessitating rapid training.

Considering students, who are mostly ‘digital natives’, technical literacy is of least concern. Nevertheless, existing studies on remote learning during the COVID-19 pandemic identified a myriad of challenges faced by young learners, in addition to psycho-social elements. For instance, [Almazova et al. \(2020\)](#) identify the lack of self-regulation, organisational and planning skills, while [Kaup et al. \(2020\)](#) and [Neuwirth et al. \(2020\)](#) noted that it was challenging to engage students in online sessions due to issues such as motivation, attention span, and focus.

Also, since the lockdowns required students (and to some extent teachers) to maintain their academic work under radically different circumstances, some struggled to digest learning contents and suffered from isolation or an increased psychological need ([Neuwirth et al., 2020](#)). Finally, in addition to the above, students in low-income settings suffered from societal inequalities, mostly in terms of lack of resources, books, and other materials. These challenges generally exacerbated the fear and anxiety associated with the pandemic, threatening the mental well-being of most young students ([Kaup et al., 2020](#); [Liang et al., 2020](#); [Pokhrel & Chhetri, 2021](#)).

Overall, whether focusing on students or faculty, the rapid transition from face-to-face to emergency remote teaching/learning has brought forward challenges facing HE, especially

in low-income settings such as in some African countries. As noted by Lucy Heady and Kwasi Kodjie (see [Sawahel \(2021\)](#)), the most frustrating threat to HE in Africa is the lack of information technology infrastructure, which has delayed and in some cases even rendered impossible the technology-supported solutions meant to sustain education during the lockdowns. In addition, the vulnerability and living context of most students, hardware, and software limitations, as well as social unrests in some African countries, fails to aid the mitigation of the impact of COVID-19 in Africa.

Although a growing body of literature is being devoted to the impacts of COVID-19 on education and educational systems, very few are empirical studies investigating students' drop-out due to COVID-19, the quality of emergency remote learning, or how COVID-19 is affecting learning outcomes. Therefore, in the subsequent subsections, a brief review of existing work on COVID-19 and research activities in a non-African context are provided, followed by a focus on the African context.

2.1.2 COVID-19, research, and researchers: A global perspective

COVID-19 and related containment measures such as the closure of HEIs and laboratories have disrupted not only teaching and learning, but also research activities, funding, mobility, career progression, among others.

COVID-19 and research

The impact of COVID-19 on research can be assessed in terms of working hours, ceasing of field/laboratory research work, shifts in research priorities, and more. Firstly, considering working hours, in a survey of 10,408 researchers in the United Kingdom, a report by [Vitae \(2020\)](#) provided evidence that 60% of researchers observed changes in their working hours during the pandemic. Similar observations appeared in a survey of research radiologist in Italy, where [Tagliafico et al. \(2021\)](#) reported a significant increase in the number of hours spent on research during the COVID-19 lockdown.

Secondly, considering the ceasing of research work, existing studies report that due to the containment measures and lockdowns, field and laboratory work were forced to discontinue or suspend valuable experiments, some of which had taken several months or years to establish ([Alam, Rampes, & Ma, 2021](#); [Will, Becker, & Weigand, 2020](#)). Mostly, non-essential and non-COVID-19-related research conducted in laboratories were significantly affected by the shutdowns ([Radecki & Schonfeld, 2020](#)).

Finally, [Alam et al. \(2021\)](#) noted that the pandemic has shifted research priorities towards preclinical and clinical research surrounding COVID-19, while [Harper et al. \(2020\)](#) mentioned 'the growing importance of research topics such as virology, which increased from 2% in 2019 to 10-20% of current biomedical research'.

COVID-19 and research resources

Shifts in research priorities and the substantial declines in revenue for HEIs are probably linked to a reallocation of research funding, as noted by [Radecki and Schonfeld \(2020\)](#) and ESSA's *Learning in Crisis Report* ([ESSA, 2020](#)). An analysis of estimates of research funding (in health sciences) by the US National Institutes of Health ([NIH, 2020](#)) for instance showed a decrease in funding for research on 'Hepatitis' and 'drug abuse' between 2019 and 2021, while an increase in funding was observed for 'Emerging Infectious Diseases', 'Infectious Diseases' and 'Pneumonia & Influenza' over the same period. Researchers such as [Radecki and Schonfeld \(2020\)](#) and [Meiksin \(2020\)](#) reported similar observations around the globe that indicate that increasing funds are being allocated to COVID-19-related vaccine, therapeutic, and diagnostic research and development.

As a consequence of increasing COVID-19-related research funding, resource cuts have been reported in the United Kingdom for cancer research ([Burki, 2021](#)), and reallocation of human capacity from cancer research to COVID-19-related research in Italy ([Bianchi et al., 2021](#)).

COVID-19 and geographical mobility

Pandemic-related travel restrictions, border closings and lockdowns severely disrupted mobility, including research mobility. Amid the COVID-19 health crisis, many PhD students, postdoctoral fellows and early career researchers have been struggling emotionally, socially, financially and legally, more than usual ([Dahdouh-Guebas & Vandebroek, 2020](#)). These challenges were exacerbated for non-United States students, postdoctoral fellows and faculty members already studying or working in that country, due to the decision to 'suspend new visas for foreign scholars' in the United States ([Subbaraman & Witze, 2020](#)).

Compared to learning and teaching during the COVID-19 pandemic, much fewer empirical studies have been devoted to research mobility. One of the studies identified on the topic is the [EURAXESS \(2020\)](#)'s survey. The authors listed difficulty in meeting research partners, mobility restrictions and limited access to research facilities as the first three impacts of COVID-19 on research. For more than 85% of the nearly 1,224 researchers surveyed, 'international mobility is an important building block for their research careers'. For [Woolston \(2021\)](#), the relative lack of scientific mobility will have long-lasting impacts that could transform research and collaboration. Nevertheless, 'Digital Mobility' and 'use of virtual exchange' appeared to be solutions to part of the research mobility disruption ([Finardi & Guimaraes, 2020](#)).

COVID-19, recruitment, and research career progression

As a result of the COVID-19 pandemic, researchers across the world have experienced reduction in productivity, which in turn has hampered their professional advancement and limited openings for their professional development ([Carr et al., 2021](#)). Early career researchers, often seen as the most vulnerable in the research community due to their often-precarious positions, are assumed to be the ones most likely to experience cutbacks ([Herman et al.,](#)

2021; Maas et al., 2020; Radecki & Schonfeld, 2020). However, the literature shows that early career researchers have been disproportionately more affected by the hiring freezes, layoffs and hardships brought on by the pandemic (Herman et al., 2021).

Using data generated by Nature journal's survey of 7,670 postdoctoral researchers, (Woolston, 2020) reported that the COVID-19 pandemic had negatively affected career prospects of almost two-thirds of the respondents. For Maas et al. (2020), the consequences of the pandemic will 'disproportionately impact early career scientists', especially those from disadvantaged and discriminated communities. Herman et al. (2021) concluded that more needs to be done at the institutional policy-making and governmental levels, to avoid creating a generation of lost researchers and early career scientists.

COVID-19, research culture, and output

The onset of the COVID-19 pandemic prompted an increase in research activity across the world, particularly in countries most affected by the pandemic, as well as across these countries, by way of research collaboration. Grammes et al. (2020) and Diéguez-Campa et al. (2020) argue that there is a strong correlation between the number of COVID-19 cases/deaths and the scientific research output from a country. As an example, Italy, one of the leading European countries severely impacted by COVID-19, had a high number of COVID-19 cases, as well as related publications. Similarly, the US, another country significantly affected by the pandemic, was identified as leading the research collaborative endeavours, sharing notable authorships with China, Italy and the United Kingdom (Grammes et al., 2020).

However, as desirable as this rapidly developed research is, there is also the risk of loss in quality and methodological rigour. Grammes et al. (2020) highlighted a recent study on COVID-19-related research which disclosed that medical journals sped up both their publication and production processes during this pandemic, with the turnover time being reduced by 49% from submission to receipt. Souza et al. (2021) concluded that despite the need for a quick publication process, it is 'undoubtedly essential to consider the methodological rigour in the execution and description of the results', so that scientific research can still be regarded as credible and useful in decision-making.

In conclusion, it is globally well documented that COVID-19 has affected research in terms of workload, ceasing of laboratory work, collaboration, research priorities, as well as research funding allocations.

2.2 COVID-19 and HE: The African perspective

This subsection discusses how the COVID-19 pandemic has impacted research and researchers in African HEIs. The literature shows that little empirical studies have been conducted in Africa, especially West Africa. Most of the available studies come from South Africa (e.g. Hedding, Greve, Breetzke, Nel, & Van Vuuren, 2020; Menon & Motala, 2021; van Schalkwyk, 2021), a few from East Africa (e.g. Agaba, 2020; Mbonyinshuti, 2020; Tamrat, 2021) and West Africa Agormedah, Henaku, Ayite, and Ansah (2020); Doumbia, Sow, Diakite, and

Lau (2020); Kokutse (2020).

2.2.1 COVID-19 and research resources in (West) African HEIs

The impact of COVID-19 on research in HEIs is particularly obvious from the dimension of funding (Marinoni et al., 2020). Securing funding for research has been a major source of revenue for HEIs, until the COVID-19 pandemic abruptly disrupted the operations of HEIs to the point where most sources of revenue became at risk (Marinoni et al., 2020). In their bid to survive, most universities were compelled to apply stringent measures in allocating the little inflows to their various sectors.

According to van Schalkwyk (2021), South African HEIs experienced several cuts in government allocation to research. The National Research Foundation, for example, saw a 19% decrease for established research grants, 13% decrease to South African Research Chairs, 29% reduction for early and emerging career grants, and 32% cut for South African Centre of Excellence. Allocations to students' financial aid schemes were also reduced. However, education support for the students increased with respect to the distribution of devices such as laptops and internet access by their HEIs, to ensure continuity through virtual engagement (van Schalkwyk, 2021). The reduction in financial aid was to enable the reallocation of funds to cater for prioritised expenditure for COVID-19 and its related activities.

With African HEIs resorting to the digitisation of their activities within already existing serious disparities in a highly unequal society, the burden of some costs in education were shifted to the individuals. However, some HEIs supported their students. For example, most students could not afford important learning resources such as laptops and internet access. Therefore, in Ghana, the University of Ghana arranged with mobile network providers to provide subsidised or free internet facilities (University of Ghana, 2020).

In addition, access to important academic research resources were curtailed during the lockdown. In Nigeria, like most African countries, libraries were closed (Omeluzor, Nwaomah, Molokwu, & Sambo, 2021), making it difficult for academics to access relevant literature. Even though many libraries provided access to e-resources, Omeluzor et al. (2021) reported that users did not receive adequate support from library staff. Furthermore, poor and expensive internet access created additional challenges.

2.2.2 COVID-19 and geographical mobility in (West) African HEIs

Generally, the pandemic-related travel restrictions and bans have impeded (physical) geographical mobility, both nationally and internationally. The burgeoning literature on the impact of COVID-19 is awash with analyses and anecdotes on such travel restrictions and how that impacted many scientific endeavours, job tenure and security, and research funding (Finardi & Guimaraes, 2020; Marinoni et al., 2020). Inability to move geographically meant that many researchers undertaking projects that required field-based work that involved international partners, or multiple sites, were unable to travel (Hedding et al., 2020). In such instances, there were catastrophic delays in data collection and project completion rates,

with commensurate implications for funding, which is often specifically linked to project deliverables and timelines (Marinoni et al., 2020).

The important role that scientific conference attendance plays in advancing the careers of researchers cannot be underemphasised. For many young scholars and researchers, mobility is essential to their growing careers (van Schalkwyk, 2021). This is because attending academic conferences, joining writing workshops and meeting mentors afford these young researchers and scholars the ability to present their latest research findings, exchange knowledge, tap into already existing networks and partnerships within their fields, and to be eligible for academic positions and career progression. Hedding et al. (2020) noted that working from home during lockdown, heightened anxiety, travel bans, and lockdowns are likely to impact the number of local and international collaborative grant applications. Similarly, the absence of in-person scientific conference attendance, due to lack of mobility, is considered a potential factor that will roll back progress with research outputs.

Considering that much of mobility and collaborations of African HEI researchers focus on the global north, and researchers from institutions in both geographic regions experienced lockdowns and travel restrictions, African researchers could not physically move around, which affected their collaborations (EURAXESS, 2020). In the Marinoni et al. (2020)'s survey, 73% of HEIs in Africa reported that the effect of COVID-19 was negative, as it weakened existing partnerships. This was found to be much higher than those in Europe (47%), Asia and Pacific (44%) and the Americas (41%) (Marinoni et al., 2020). These trends have both short- and long-term implications for African HEIs and researchers.

To reduce the negative effects of the lack of mobility, limited networking and collaboration, the academe shifted to online technologies as a way of safeguarding internationalisation. Virtual mobility and online learning have remained the alternatives to physical mobility (Marinoni et al., 2020). Even though the COVID-19 pandemic has pushed the frontiers of technology to provide seamless online platforms such as Zoom, Google Meet, institutions-curated platforms, unto which scientific conferences are rolled, these present specific challenges for regions in the global south and many sub-Saharan African countries (Marinoni et al., 2020; van Schalkwyk, 2021).

As the effects of the pandemic linger, the regional disparities and inequalities heighten. In comparison to other regions, a shift from physical to virtual mobility seems to be the most difficult in Africa. This has been attributed to challenges of access to technical infrastructure, such as Information and Communications Technology (ICT) tools, literacy in online platform use, internet access, and network connectivity issues (Marinoni et al., 2020). In addition to these, uncertainty, frustrations and burnout, which are reportedly high during pandemics, seem to make virtual mobility an utmost participation in such virtual engagement restrained and even impossible (Hedding et al., 2020).

2.2.3 COVID-19, recruitment, and career progression in (West) African HEIs

The decline in public funding, and especially tuition fees for private HEIs as a result of the pandemic, have impacted institutions' recruitment and retention plans (van Schalkwyk, 2021). In most private HEIs, tuition fees, the main source of revenue, are collected on a monthly or semester basis. The lockdown made it difficult to collect these fees. Students felt it was unfair to continue paying fees when they were getting poor quality tuition because of poor access to internet and related challenges (Tamrat, 2021). In line with this, private HEIs, for example in Uganda, took the decision to furlough some staff members and informed others that salaries would not be paid until students return (Agaba, 2020). Similarly, there was a freeze on hiring and some part-time roles were scrapped temporarily in many institutions in Ethiopia (Tamrat, 2021).

The uncertainties among staff created further problems for institutions. For example, some of the experienced academics in private HEIs left for other career opportunities, resulting in an attrition rate of 20% or more (Mbonyinshuti, 2020). The situation was quite different in public institutions, though, mainly because staff salaries are paid by the government. According to van Schalkwyk (2021), there has not been any report of academic retrenchment in South Africa, even though concerns have been raised about potential job losses in the future. In addition, the increasing reliance on technology for teaching and research due to the pandemic may restrict opportunities for those lacking these skills or reluctant to learn (Menon & Motala, 2021).

Another area that has suffered from the pandemic in Africa is career progression of academics. In many HEIs, career progression is primarily based on research publications. The measures to manage the pandemic have reduced opportunities to conduct research, leading to delays and cancellation of clinical trials and fieldwork (Hedding et al., 2020). In addition, the workload of academics has increased due to increased domestic responsibilities and the need to provide additional support to students who struggle with online learning and their mental health (Menon & Motala, 2021).

These challenges are likely to disproportionately affect male and female researchers. For instance, Menon and Motala (2021) argue that research productivity of female academics is more affected than males. This is because even in most high earning families, women remain primary caregivers. These additional commitments reduce the time available for women to prepare manuscripts for publication, and/or to apply for funding to enhance their career progression.

Furthermore, research shows that lockdown has more impact on early career researchers than their senior colleagues (van Schalkwyk, 2021). From a postdoctoral researcher's perspective, working from home has reduced collegial relations, which is an important learning space (Hedding et al., 2020). For example, meetings are still organised on Microsoft Teams, which although useful to some extent, does not provide the benefits of in-person meetings such as pre-and-post meeting catch ups to share research ideas with senior colleagues.

2.2.4 COVID-19, research culture, and outputs in (West) African HEIs

The positioning of HEIs as places of learning and centres for generating new knowledge make the development of research culture imperative in promoting evidence-based practices and policies. The COVID-19 outbreak has resulted in a surge of research to help shape an evidence-based global health response to the pandemic (Doumbia et al., 2020). Gwenzi and Rzymiski (2021) argued that the COVID-19 outbreak in 2020 had the most exceptional research response in the world's history of research into human infections.

While countries across the world have rushed to join the discourse on COVID-19, African countries have appeared subdued in their response to this global outbreak. Gwenzi and Rzymiski (2021) questioned why African countries and their universities, including professional medical bodies and medical schools, have remained absent in this COVID-19 research. Based on results by Nowakowska, Sobocińska, Lewicki, Lemańska, and Rzymiski (2020), compared to the other regions across the world, including the developing ones, Africa's contribution to the global research on COVID-19 has been extremely low. Between January and March 2020, researchers associated with African scientific institutions contributed 0.5% to global research outputs, making up only 22 out of 3,487 contributions (Nowakowska et al., 2020).

In a survey by Mawazo-Institute (2020) on the impact of COVID-19 on African HEIs, only 38.5% of respondents were at institutions providing e-learning options by May 2020. This study found that West African respondents were the most involved in laboratory research (37.4%), compared to 28.6% for Southern African respondents and 28% for East African respondents. However, most respondents (72.5%) had suspended their field/laboratory research as a result of COVID-19.

Lastly, most research initiatives by HEIs in developing countries are funded by agencies and foundations in the United States, European countries and most recently, China. With all these countries so badly hit by the pandemic, research projects across these different regions were severely disrupted (Goolam, 2020). It is therefore perhaps no surprise that a survey by the (Marinoni et al., 2020) indicated that 85% of HEIs from Africa reported that research in their institutions had been affected by COVID-19. In conclusion, although relatively little research on the impact of COVID-19 can be identified in Africa, the few existing studies have shed light on how the pandemic is affecting HEIs and researchers.

3 Methodology

To provide an in-depth understanding of the impacts of COVID-19 and the responses from West African universities, this study focused on the case of UCC and UFHB to collect qualitative and quantitative data. The population of the data collection process was the heads of faculties, faculty members and PhD students at both universities. Below are the instruments used for the data collection.

3.1 Data collection instruments

We relied on three main instruments to collect data to help understand how COVID-19 has affected West African HEIs. These involved a survey, interviews, and focus group discussions.

Survey

The survey rolled out at UCC and UFHB covered four main topics. These were COVID-19 and research resources, research mobility, career progression and recruitment, and research culture and outputs. The survey started with an eligibility question that weeded out non-academic personnel.

The section on COVID-19 and research resources addressed how COVID-19 has impacted time allocation to research, institutional support, sources of research funding and the effects of COVID-19 on research funding. The research mobility section included questions on the extent to which COVID-19 pandemic has affected national and international mobility, and the potential future changes in research mobility due to the pandemic. The section on career progression and recruitment included questions about the effect of the pandemic on professional network, training and development, career plans, goals and ambitions, and new recruitments. The last section addressed the value and promotion of research activities, the effects of the pandemic on collaboration, and potential future changes in research outputs.

Interviews and focus group discussions

The interview and focus group guides provided questions to get a deeper understanding and explanation to some of the responses from the survey. For example, heads of faculty were interviewed to address the policies, programmes, and facilities provided to support research activities and improve the capacity of research staff and PhD students. These interviews also probed what support the heads are seeking from stakeholders, such as funders, to enable them to address the challenges of the pandemic and plan for the future.

For PhD students, the focus group discussions explored how the pandemic has affected their studies in terms of supervision, conference participation, completion, and the support required from their institutions and other stakeholders such as funders, to enable them to respond adequately to the pandemic and future challenges.

3.2 Data analysis

Data collected by means of the survey was analysed using techniques of descriptive statistics. Trends appearing from the survey questions were graphically displayed in percentages and presented in easily understandable formats.

A thematic approach was used to develop relevant themes from the data obtained through the interviews and focus group discussions.

4 Project outputs

4.1 UFHB and UCC: a brief description

UFHB: [Université Félix Houphouët-Boigny](#) (Côte d’Ivoire), previously known as University of Cocody, is a HEI resulting from the Centre for Specialised Studies created in 1958, and the Abidjan Higher Education Centre created in 1959. The latter became the National University of Côte d’Ivoire (in 1977) and is considered the direct forefather of UFHB. The University has approximately 58,000 students and 2,000 faculty members (teaching staff). UFHB is currently ranked the best university in Côte d’Ivoire, ([Edurank, 2021](#)), based on research performance, non-academic reputation, and the impact of 12 notable alumni.

UCC: The [University of Cape Coast](#) is a public research HEI in Cape Coast, Ghana. It was established in October 1962 as a University College. On 01 October 1971, the College attained the status of a full and independent University. From an initial student enrolment of 155 in 1963, the University of Cape Coast now has a total student population of 74,720. In 2021, the Times Higher Education ranked UCC as the best university in West Africa and fourth in Africa for teaching, research, knowledge transfer and international outlook.

4.1.1 COVID-19, research, and researchers at UFHB and UCC

As indicated earlier, four main research objectives guided this study. These relate to the distribution of research resources, geographical mobility, career and recruitment, and research culture and output. Below is an overview of the survey data relating to the impacts of COVID-19 on research and researchers at both UFHB and UCC.

Sample description

By December 2021, 255 researchers, representing 180 and 75 from UFHB and UCC, respectively, had responded to our survey. Table 2 reports participation data in both West African HEIs considered.

Table 2: Participation in the data collection process

Institutions	Survey respondents	Interviews	Participants in focus groups
UFHB	180	-	10
UCC	75	5	7

Regarding the gender composition of the sample in both HEIs, circa 70% of respondents were male and 30% were female academics (Fig. 1). About qualitative data, respectively 10 and 12 academics participated in our focus group discussions and interviews at UFHB and UCC respectively.

Fig. 1-A: UFHB | Sample description: Gender

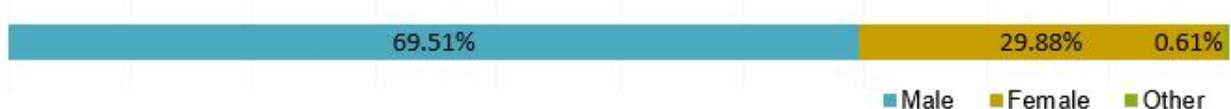


Fig. 1-B: UCC | Sample description: Gender



Considering age groups, at UFHB, most of the respondents (52.44%) were between 45 and 59 years old, while 33.11% were between 30 and 44 years old. At UCC, we observed a contrasting tally, with most respondents (52.11%) being between 30 and 44 years old, while 38.03% were between 45 and 59 years old (Fig. 2).

Fig. 2-A: UFHB | Sample description: Age groups (in years)



Fig. 2-B: UCC | Sample description: Age groups (in years)



A review of the academic disciplines of the respondents revealed that ‘Social sciences’ and ‘Medical, health and life sciences’ represented almost 75% of the responses obtained at UFHB, whereas at UCC, ‘Social sciences’ and ‘Arts and Humanities’ were the most represented disciplines (72%) (Fig. 3).

Fig. 3-A: UFHB respondents by discipline

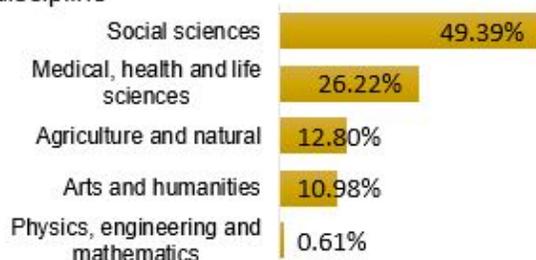
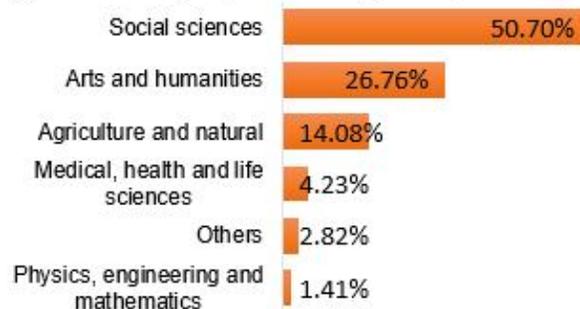


Fig. 3-B: UCC | respondents by discipline



COVID-19 and research funding

To analyse how COVID-19 has affected research funding, it is important to primarily understand the ecosystem of such funding in West African universities by identifying the main sources of research funding.

Fig. 4-A: UFHB | What is your main source of research funding?



Fig. 4-B: UCC | What is your main source of research funding?



Responses to the survey question, ‘What is your main source of research funding?’, revealed that most researchers self-finance their research activities (66% at UFHB and 77% at UCC), while 23% and 11% of researchers at UFHB and UCC, respectively, depend on funding from private institutions.¹ As shown in Fig. 4, very few researchers mentioned public funding as being their primary source of funding for research activities.²

Group discussions with faculty members and doctoral students provided additional details regarding research resources. It was confirmed that most researchers rely on personal finances, and that students pay for the bulk of their study costs using personal resources and with the support of their families:

‘I use personal funds for most of my research. I buy items such as seeds and chemicals and pay travel expenses. I have other colleagues that spend a lot. Every year, they would spend more than... Sometimes... all from their own personal resources.’ (Faculty member, UCC)

‘I am currently financing my thesis on my own. I had a scholarship until the third year and then nothing.’ (PhD student, UFHB) *‘Personal finance. I do not have funding for the thesis.’* (PhD student, UFHB)

‘There is a government grant for postgraduate students, but my application delayed. Maybe the COVID might have affected the smooth running of those funds.’ (PhD student, UCC)

‘You know, the grant from government is not enough. It can’t even pay my fees. I depend on my salary, and my wife has also been very helpful.’ (PhD student, UCC)

The universities provide some support, which unfortunately is very limited:

¹Among others, Nestlé’s R&D Initiative and Fund for Agricultural Research and Advisory Services (FIRCA) at UFHB and Center for Global Development and Bill & Melinda Gates Foundation at UCC.

²Researchers mentioning ‘others’ as the main source of funding describe their response as corresponding to a mixture of personal finances and funding from private institutions.

‘Regarding my department, some funding is provided to those who undertake collaborative research with other departments or researchers in different institutions in Ghana or elsewhere’. (Faculty member, UCC)

‘The faculty has some funds available for us to apply to attend a conference or a meeting. The application goes through assessment to ensure the requirements are met’. (Faculty member, UCC)

Fig. 5-A UFHB | Impact of COVID-19 on research funding - 1

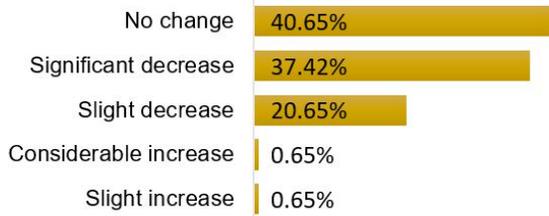
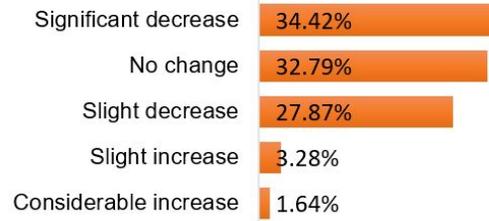


Fig. 5-B: UCC | Impact of COVID-19 on research funding - 1



The survey question, ‘How has the COVID-19 pandemic affected your main source of research funding relative to times before it?’ was used to understand the effects of the pandemic on research funding, as experienced by the Ivorian and Ghanaian researchers themselves. For more than 58% and 61% of UFHB and UCC academics respectively, COVID-19 has caused a decrease in their research funding (Fig. 5).

A shortcoming of the survey question relating to the impact of COVID-19 on research funding is that it does not reflect the effects of the pandemic by funding source. Additional analysis of the previous result by source of funding (Fig. 6) revealed that decreases in research resources were largely experienced by self-funded researchers at UFHB, possibly due to changes in personal income during the pandemic (Fig. 6-A). Similar figures were observed at UCC, as most researchers who rely on personal finances as their primary source of research funding reported significant decreases (Fig. 6-B).

Fig. 6-A: UFHB | Impact of COVID-19 on research funding - 2

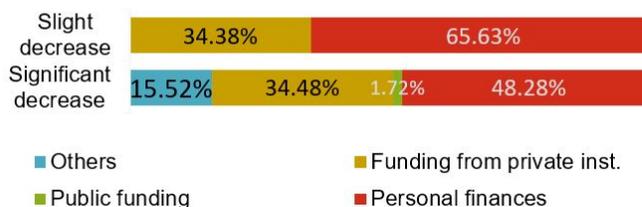
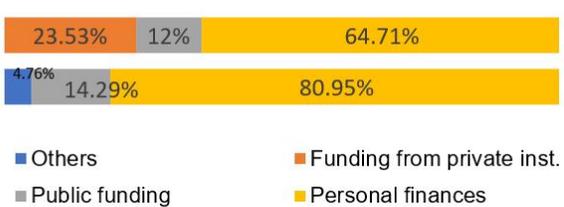


Fig. 6-B: UCC | Impact of COVID-19 on research funding - 2



For this question, data from the focus group discussions and interviews corroborated the observation that the negative effect observed is due to change in personal finances:

‘The COVID-19 pandemic has affected me so I could not do as much research as I would have liked to. I had to save money to do other things, not research.’ (Dean, UCC)

‘Things got worse. Normally, when needed, I would ask for help and people often helped me financially. But since COVID, most people are not responding favourably.’ (PhD student, UFHB, self-financing his/her research.)

COVID-19 and research mobility

Literature on the effect of COVID-19 and academic mobility globally shows that the pandemic and related restriction measures have caused monumental disruptions to research, teaching and learning. Therefore, similar observations could be expected regarding the mobility of researchers at UFHB and UCC, since 95% and 73% of academics surveyed at UFHB and UCC respectively indicated that national and international mobility are a normal part of their teaching and/or research activities.

Fig. 7-A: UFHB | Do your teaching and / or research activities normally involve national and international mobility?

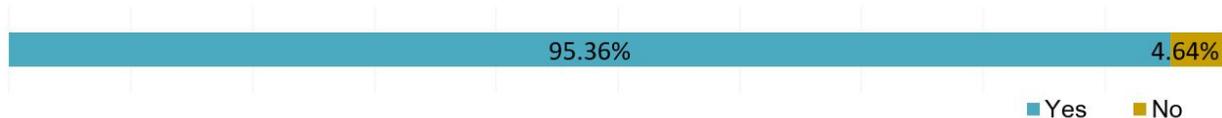


Fig. 7-B: UCC | Do your teaching and / or research activities normally involve national and international mobility?



The survey data regarding the impact of COVID-19 on research mobility, as experienced by researchers over time (Fig. 8) confirmed the observations in the literature, since most academics reported that the pandemic has affected their national and international research mobility. More specifically, considering UFHB researchers, while 61% of respondents reported severe impacts of the pandemic on mobility a year ago, only 39% and 30% reported a severe effect six months ago, and at the time of the survey, respectively (Fig. 8-A).

Considering the case of UCC researchers, compared to 53% of respondents who reported a severe effect a year ago, only 15% of academics indicated that the pandemic is currently having a severe impact on their research mobility. Overall, it was observed that data from both UFHB and UCC reflected changes in the severity of the impact of COVID-19 on academic mobility over time. A possible explanation for this finding is the vaccination of researchers as well as the periodic relaxation of COVID-19 restrictive measures, which make national and international mobility increasingly feasible.

The qualitative data revealed the following regarding international students and conferences:

‘As for mobility, yes, it has affected us because now we can’t travel much. We used to have exchange programmes, but that has been affected badly. I had one student from Nigeria studying here for his PhD before COVID hit. He’s still here, but since

Fig. 8-A: UFHB | To what extent has COVID-19 affected your research mobility?

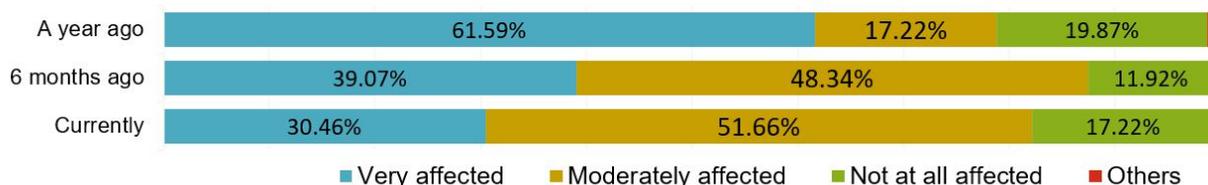
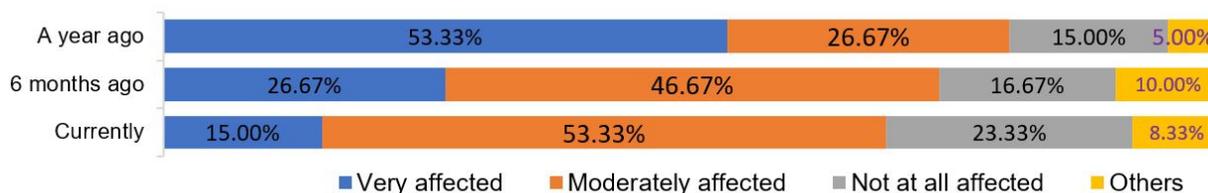


Fig. 8-B: UCC | To what extent has COVID-19 affected your research mobility?



COVID arrived, we haven't had any new international students come over. (Head of Department, UCC)

'Somewhere in November 2020, I was supposed to travel to Malaysia and I thought I was going to be able to meet a researcher whose papers I have cited so many times. Unfortunately, because of COVID, that event was changed to virtual mode. I would have loved to meet that researcher face-to-face and probably move our link beyond where we are now. However, that didn't happen because of COVID.' (Faculty member, UCC)

'Of course, moving events online has been helpful. However, because of the nature of our system, you won't always get access to the online facility. Sometimes, you may run out of internet data, and so on, and so forth.' (Head of Department, UCC)

Other observations by a faculty member and doctoral student are:

'In the office, internet is not stable. Stressful, very, very stressful, because you want to get things moving smoothly and out of no fault of yours, you won't get the things done. Very, very, very stressful.' (Faculty member, UCC)

I was on an academic mobility visit to Dakar when the confinements took place. I was stuck at home and couldn't work effectively from home because there were too many people in there. I could not travel back to my country either.' (PhD student, UFHB)

COVID-19, career progression, and recruitment

We used the following survey question to assess the impact of the pandemic on researchers' careers, with respect to advancement, recruitment, and layoffs, 'Compared to before the pandemic, how would you evaluate the effects of the pandemic on the following aspects of the career of researchers at your institution?'

Regarding advancement, new recruitment and layoffs, most survey respondents from the HEIs considered reported no changes compared to before the pandemic:

Fig. 9-A: UFHB | COVID-19 and research career progression

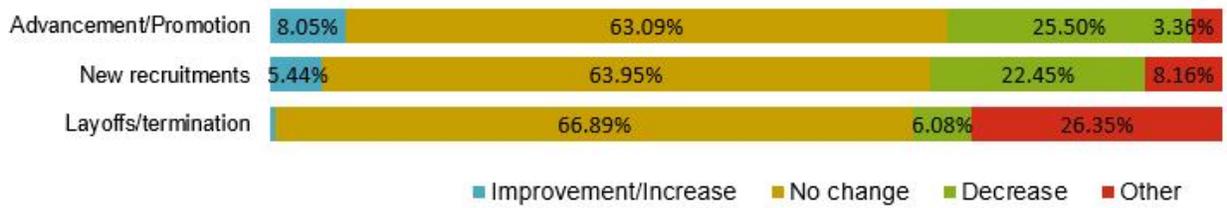
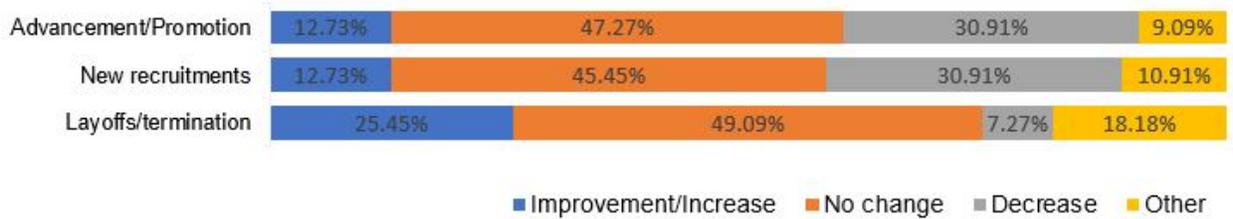


Fig. 9-B: UCC | COVID-19 and research career progression



‘Recruitment depends on our needs and funding. If we have the need to recruit, we do. I don’t think the COVID has affected that much.’ (Dean, UCC)

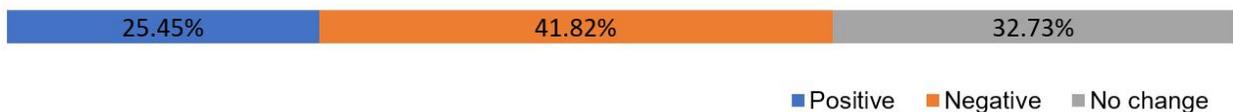
A possible explanation for this observation is the type of institutions we considered in these case studies (i.e., public African universities) and the employment contracts available in such universities. In this context, the researchers are public servants and generally have fixed-term contracts. It is therefore unsurprising that the respondents largely reported no changes in their career advancement or termination.

Regarding career ambitions, while 44% of academics at UFHB and 33% at UCC reported no change in their situation due to COVID-19 (Fig. 10), 48% and 42% respectively indicated that COVID-19 negatively affected their ambitions and goals.

Fig. 10-A: UFHB | Impact of COVID-19 on your ambitions and career goals - 1



Fig. 10-B: UCC | Impact of COVID-19 on your ambitions and career goals - 1



Since our sample constituted researchers at different career stages and from different age groups, we were keen to understand whether/how age group could affect the impact of COVID-19 on career goals. We observed that the figures obtained from the survey reflected

the age composition of our sample. At UFHB where most survey respondents were between 45 and 59 years old (compared with UCC, where most survey respondents were between 30 and 44 years old), most researchers who reported negative effects of COVID-19 on their career goals were also between 45 and 59 years old (compared with 30 and 44 years old for UCC). Therefore, overall, at UFHB and UCC, the age group analysis indicated that for a non-negligible proportion of young and middle-aged academics, the COVID-19 pandemic is perceived to have had negative effects on their career ambitions and goals.

Fig. 11-A: UFHB | Impact of COVID-19 on your ambitions and career goals - 2

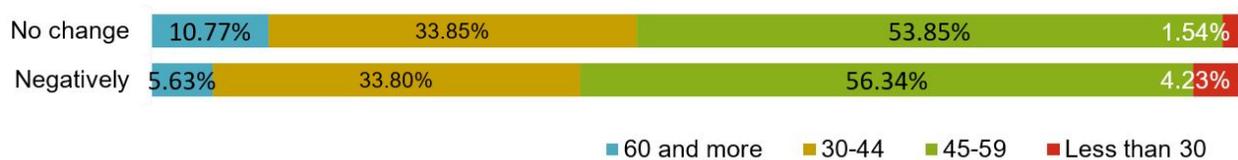
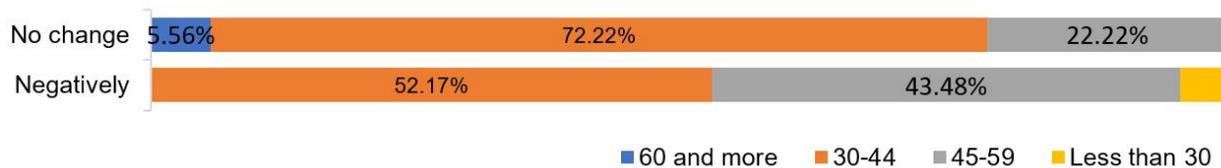


Fig. 11-B: UCC | Impact of COVID-19 on your ambitions and career goals - 2



Furthermore, our analysis questioned the impact of COVID-19 on career progression, as perceived by the researchers. At UFHB and UCC, 64% and 50% of respondents, respectively, indicated a decrease in their career progression opportunities (Fig. 12).

Fig. 12-A: UFHB | Impact of COVID-19 on chances of career progression or other career opportunities

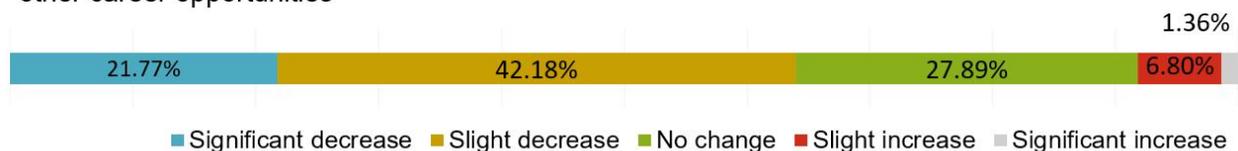
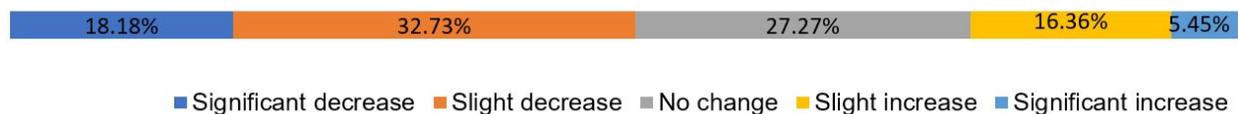


Fig. 12-B: UCC | Impact of COVID-19 on chances of career progression or other career opportunities



Data from focus group discussions and interviews also shed light on the mixed experiences of individual researchers with respect to career progression opportunities. While some faculty members reported that the pandemic has slowed their career progression, others indicated

that it has helped them to access the next stage in their careers. For doctoral students, the pandemic has increased the uncertainties associated with their recruitment:

‘I came here as a Senior Research Assistant, and I have risen through the ranks. I decide when I want to put in my application for promotion so COVID shouldn’t affect that. However, the most recent application took so long, more than three years. Therefore, in that case, I can’t tell whether the assessors took that long because of COVID.’ (Head of Department, UCC)

‘For me, a positive one. During the COVID peak, I was able to publish three good papers, which has helped to augment the number of articles that I had to push me to the next level.’ (Faculty member, UCC)

‘I think that, personally, it has helped me a lot. In fact, COVID has been a blessing, as far as my career progression is concerned. Last year, I published eight papers and because of that, I applied for accelerated promotion, and I got it.’ (Faculty member, UCC)

‘Yes, a negative impact. In our group, for example, losing a year delays graduation and therefore reduces our chances of being recruited into academia.’ (PhD student, UFHB)

COVID-19, research culture, and output

Research culture involves the values, collaborations, training, research priorities and the norms of a research institution. Therefore, to assess the impacts of the COVID-19 pandemic on research culture in West African HEIs, we primarily used survey questions relating to research collaborations and how institutions supported academics to pursue research activities during the pandemic.

Fig.13-A: UFHB | Impact of COVID-19 on research collaboration



Fig.13-B: UCC | Impact of COVID-19 on research collaboration



Literature reveals that by interrupting research mobility, laboratory and fieldwork, COVID-19 has disrupted research collaboration. Our survey data supports this. For many respondents, 77% of UFHB and 45% of UCC academics, the pandemic has deteriorated their research collaborations (Fig. 13). The qualitative data reflects similar perspectives regarding the negative effects of COVID-19 on collaboration:

‘I was even supposed to go to Germany to meet up with some other researchers to discuss some collaborations, but it never happened.’ (Dean, UCC)

‘COVID-19 has slowed down my research. I have partners/collaborators involved in my research. Due to COVID, we were unable to meet, and the phone work was not efficient. Even though some of the data was available, it was not possible to move on to the next steps or do the actual job. People were also scared to meet with you.’ (PhD student, UFHB)

For some researchers, COVID-19 has interrupted research (fieldwork) and hence those with existing data benefited:

‘I was meant to collect data. We got to the field, and the communities told us they hadn’t recorded any cases of COVID-19 so they would not allow anyone from outside the region to enter the district to do research. Even though we assured them of the COVID protocols, they said no. So, we had to come back. Just look at the costs.’ (Dean, UCC)

‘I remember my group tried to access the online library resources. Unfortunately, we were not able to get enough literature for our PhD research. Maybe, if we had got the chance to go to the library physically, we would have had some material, but we didn’t get that chance to do that due to the closure. This affected the progress of my work.’ (PhD student, UCC)

‘With the confinement and closure of the Uni, I stayed home, spent more time watching TV, cooking, playing sports and could not concentrate on doing research. At first, I oddly thought that containment and working from home would be useful for my research. In fact, COVID has slowed down my work.’ (PhD student, UFHB)

‘In terms of research, if you had existing data before COVID, then good for you. The lockdown was used judiciously with my collaborators to write a few manuscripts for publication.’ (Faculty member, UCC)

Regarding institutional support to pursue research during the pandemic, the survey questions covered aspects such as ICT training, financial support, capacity building and support for laboratory and fieldwork. Data collected at UFHB suggested that there was limited institutional support for academic research during the pandemic, particularly with respect to financial support, access to laboratory and fieldwork, as well as capacity building (Fig. 14).

Considering UCC, most respondents indicated that they received research training (capacity building) and ICT support/training from their University during the COVID-19 pandemic. Nevertheless, UCC academics largely agreed with their colleagues from UFHB regarding the lack of institutional financial support.

The group discussions and interviews reflected the observations above, by implying that institutional support was provided in some areas, at UCC:

‘My department was fully connected with internet. We have Wi-Fi and landline. So, if the Wi-Fi is not working, we switch to the landline. I will say we are able to work online quite smoothly. I know some departments bought internet credit for staff.’ (Faculty member, UCC)

‘I remember the University organised an online workshop for us on how to use the Learning Management System (LMS) during COVID. Yes, we were taught how to use the LMS for teaching.’ (Faculty member, UCC)

Fig. 14-A: UFHB | COVID-19 and institutional support to pursue research activities

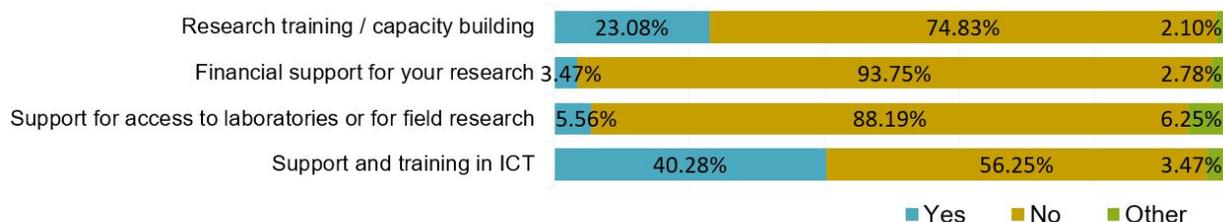
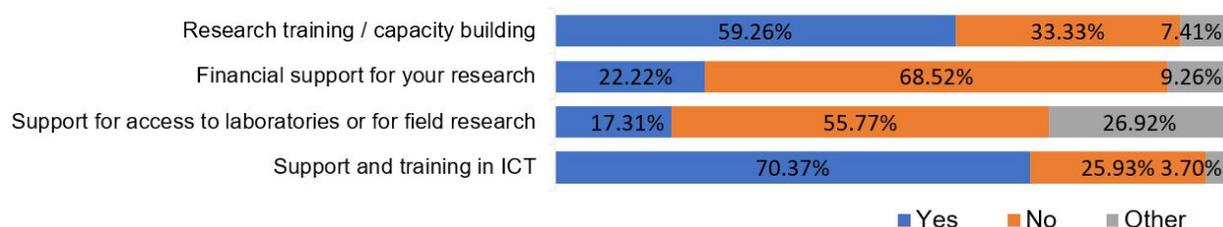


Fig. 14-B: UCC | COVID-19 and institutional support to pursue research activities



‘The Faculty of Science, Technology and Education organised capacity building on internet use and Moodle use for us. I think once or so.’ (Faculty member, UCC)

‘We’ve had series of workshops, especially on research methods. I know how to use SPSS and other research related tools for my research.’ (PhD student, UCC)

Besides these positive notes, it was observed that not every department provided capacity building though:

‘No institutional support during pandemic. I even solicited financial and technical support from my Department but received nothing.’ (PhD student, UFHB)

‘My Department has not officially organised any capacity building. What I remember is that the Department acquired a Zoom license and then I was unofficially going around teaching colleagues how to use it.’ (Faculty member, UCC)

‘To be honest, we really adapted to the situation. Institutional support has been announced, we haven’t seen any actual support.’ (Faculty member, UFHB)

We assessed how COVID-19 affected research outputs (book chapters, books, research articles/papers, and policy papers), by asking researchers to report their annual count, on average, of research publications before and since the pandemic. Fig. 15 reports data on research outputs. Survey data from UFHB suggested that the share of researchers with one publication per year has increased since the pandemic began, while the proportion of researchers with more than three publications a year has decreased. Interestingly, in the case of UCC, a continuous decline has been observed in research publications since the pandemic began.

Fig. 15-A: UFHB | COVID-19 and research output

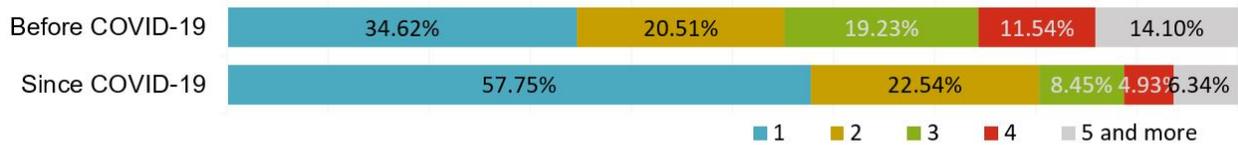
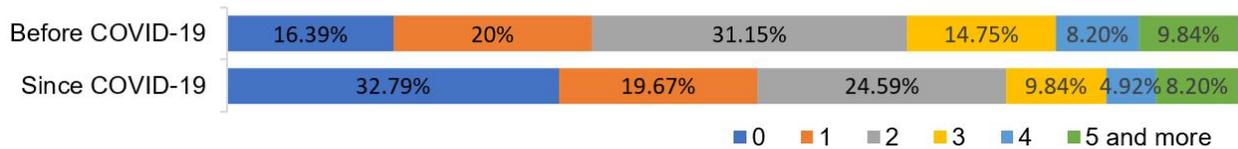


Fig. 15-B: UCC | COVID-19 and research output



A gender perspective

To capture the gender effects of COVID-19 on academics, we asked researchers, ‘Do you think that the impact of the COVID-19 pandemic was experienced differently by male and female academics/researchers in your institution?’ Data generated for this question indicated that for 62% and 68% of respondents from UFHB and UCC, respectively, the impact of the COVID-19 pandemic was felt in the same way by male and female academics.

Fig. 16-A: UFHB | Do you think that the impact of the COVID-19 pandemic was experienced differently by male and female academics?

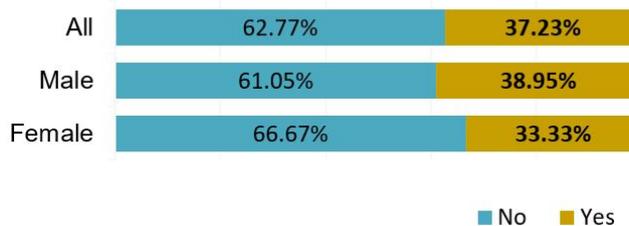
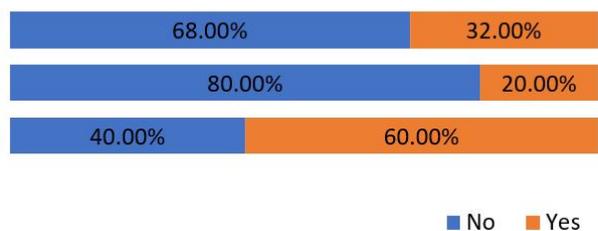


Fig. 16-B: UCC | Do you think that the impact of the COVID-19 pandemic was experienced differently by male and female academics?



A more in-depth analysis focusing on groups of male and female respondents at UFHB resulted in a similar conclusion and supported the absence of a gender bias in the initial results (Fig. 16-A). Contrary to UFHB, where the responses reflected the gender composition of the sample, 80% of male researchers at UCC disagreed with the possibility of a gender effect of the pandemic, while 60% of female academics reported that the pandemic was experienced differently by male and female researchers. Such viewpoints were confirmed in group discussions and interviews conducted at UFHB and UCC:

‘Not really in terms of research. But at home, almost everything relating to caregiving was on me.’ (Female PhD student, UFHB)

‘Well, I think that when you’re quarantined at home, the females have more work to do at home. Yes, I think that the focus becomes taking care of the home. A lot of the roles

in the house are played by the female. I don't want to say that the males don't do any work.' (Male Dean, UCC)

'I had my four kids with me, and it was challenging. When you locked yourself in the room, they were knocking at the door, especially the small one asking "Mummy, can I come in?" They would be shouting and that distracted you from what you were doing. I could have used that time to work on my research, but it was difficult.' (Female faculty member, UCC)

'I have a boy who was preparing to write his Basic Education Certificate Examination during that time. My attention had to be shifted to him and help him to prepare for the exam. So, we had to be doing that until he was called back to school. I had to put my research aside. That is how the quarantines affected my work.' (Female PhD student, UCC)

In addition, we probed whether gender (in)equality was impacted by the pandemic by asking UFHB academics whether they perceived that gender inequalities had changed with respect to academic mobility, career progression, collaboration, research, and teaching and learning. Of the five aspects considered, unanimously, most researchers reported that gender inequalities remained unchanged during the pandemic (Fig. 17).

Fig. 17-A: UFHB | During the pandemic, have gender inequalities increased, decreased or remained unchanged in terms of the following?

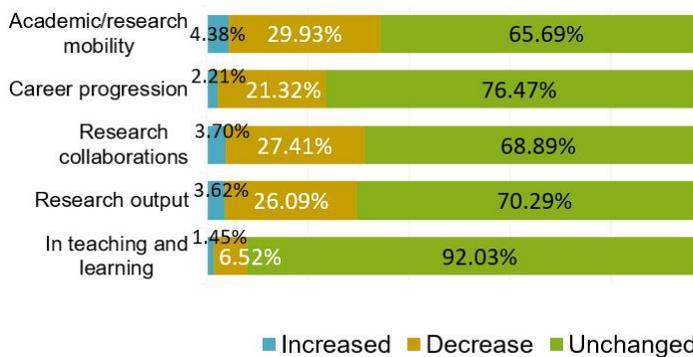
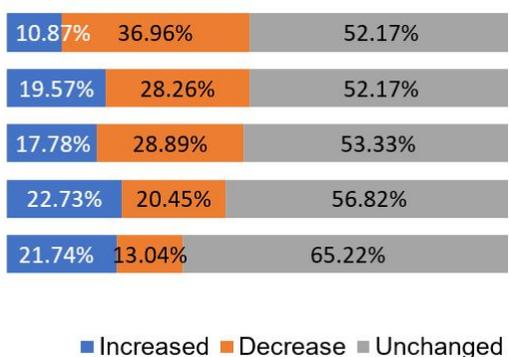


Fig. 17-B: UCC | During the pandemic, have gender inequalities increased, decreased or remained unchanged in terms of the following?



In summary, this subsection provides insights into the impacts of COVID-19 on West African universities by focusing on case studies at UFHB and UCC and considering four main streams. Overall, analysis of the data collected revealed that most researchers at the considered HEIs were (and are still) self-financing their research activities. They reported a decrease in research funding due to the COVID-19 pandemic and that was probably caused by changes in their personal finances.

Regarding national and international research mobility, the data revealed a negative effect of COVID-19 but suggested that the severity of the latter over time is decreasing, possibly due to the relaxation of restrictive measures and the vaccination of researchers. Since UFHB and UCC are public HEIs, most researchers reported no changes in layoffs, career progression and new recruitments during the pandemic. However, they observed a decrease in career

progression opportunities and in research collaborations.

Finally, our analysis revealed that gender inequalities at UFHB have remained unchanged during the COVID-19 pandemic. However, compared with UFHB, where the responses reflected the gender composition of the sample, at UCC, most male researchers disagreed with a gender effect of the pandemic, whereas a significant proportion of female researchers reported that the pandemic was experienced differently by male and female researchers.

5 Problems and challenges

This study provides insights into how the COVID-19 pandemic has affected West African HEIs and the responses of the latter by focusing on the case of UFHB and UCC. To do so, our methodological approach consisted of deriving teachings from existing literature and analysing data collected from a population of doctoral students, faculty members and heads of faculties in both African HEIs we considered. This research, especially the data collection process, encountered some problems and challenges which are worth mentioning, to reflect lessons we have learnt.

The research started during university holidays in August 2021 and throughout the period, it was technically difficult to engage with researchers and staff, due to COVID-19 security measures. At UFHB, in addition to restrictions related to COVID-19, data collection effectively began several weeks after the start of the project, since their 2021-2022 academic year started on 18 October 2021. Other issues that affected the data collection included the lack of an administrative academic mailing list, which would have allowed the survey to be quickly disseminated online.

At UCC, a strike by university teaching staff and the delay in obtaining research ethics approval from the University's Institutional Review Board delayed the data collection. Furthermore, in mid-November 2021, UCC academics were asked to go home on leave until January 2022, which further impacted data collection. A final aspect of the problems encountered during this research at UCC was the so-called researchers' survey fatigue, which occurs when academics are overwhelmed by surveys.

These challenges, which obviously had an impact on the timelines and response rates at UFHB and UCC, prompted us to mainly rely on online surveys. We adopted a non-probabilistic sampling approach as a fallback solution, although we were aware that a higher response rate was required for statistical power.

To address some of these challenges, we increased the number of interviews and focus group discussions, especially at UCC, to capture responses to aspects of our research questions that the survey data (sample size) may not have done effectively. Indeed, the qualitative data provided excellent insight into most of our research objectives. However, as it is well-known, such data can still suffer from intrinsic biases such as sample bias, subjectivity, interpretation of questions, among others.

6 Overall assessment, recommendations, and evidence gaps

6.1 Overall assessment

The aim of this report is to capture the impact of the COVID-19 pandemic on West African research and HEIs, and how the institutions are responding. The report focuses on case studies at UFHB and UCC. Therefore, although some generalisations are made, the authors do not intend to imply that the findings are ubiquitous across all HEIs in the region. Overall, an analysis of the data collected in these HEIs revealed that the COVID-19 pandemic has affected research activities, mobility, funding, collaboration at both UFHB and UCC. In addition, most researchers reported very limited institutional support, whether regarding fieldwork, capacity building, ICT training or research funding. Here are the take-aways from the analysis:

- for most researchers at UFHB and UCC, 58% and 61% respectively, COVID-19 has caused a decrease in their research funding, which is largely from private sources. Explicitly, most researchers self-finance their research activities (66% at UFHB and 77% at UCC, respectively), whereas 23% and 11% of academics from UFHB and UCC, respectively, rely on funding from private institutions;
- the pandemic has negatively impacted academic mobility. However, the severity of the impact of COVID-19 on academic mobility has decreased over time;
- academics from UFHB and UCC, being public servants (on fixed-term contracts), may explain why respondents largely reported no changes in their career advancement or termination. Nevertheless, at UFHB and UCC, 64% and 50% of academics, respectively, reported a decrease in career progression opportunities;
- at UFHB, the share of researchers with one publication per year has increased since the pandemic began, while the proportion of researchers with more than three publications a year has decreased. Interestingly, in the case of UCC, an overall decline has been observed in research outputs since the pandemic began;
- for most respondents, 77% of UFHB and 45% of UCC academics, the COVID-19 pandemic has caused a deterioration in their research collaborations;
- very limited institutional support has been provided to West African academics;
- contrary to UFHB, where there seems to be no gender bias in the responses, at UCC, most male researchers (80%) disagreed with the gender effects of the pandemic, while most female academics (60%) reported that the pandemic was experienced differently by male and female researchers; and,
- although academics agreed that gender inequalities have remained unchanged during the pandemic, the respondent's gender (at UCC) appeared to affect their perspective on how male and female researchers experienced the impacts of the pandemic.

6.2 Recommendations

Based on the data from the two case studies, it is undeniable that COVID-19 has affected research and researchers in West African universities, regardless of gender, discipline, and career level. According to the respondents who pursue research, collaboration, and other academic tasks in the HEIs where the case studies were conducted, there has unfortunately been very limited institutional support available. It is not clear why. Therefore, the recommendations arising from this empirical analysis are intended to reflect the findings and suggestions of academics involved in the various stages of our data collection, mainly in the focus group discussions and interviews. These recommendations can be classified into three categories: capacity building and infrastructure; research culture; and research funding.

● Capacity building and infrastructure

In most African HEIs, capacity building is needed in specific areas such as the use of ICT tools for research and teaching, grant writing, academic writing, among others. This will allow academics to smoothly pursue research activities and collaboration in situations of limited mobility. As noted by some faculty members, for instance, the UCC faculty member below, their HEIs could be more supportive of researchers:

‘As a matter of fact, the University is not doing much in terms of helping us to know how to search for grants, maybe grant writing courses and how to write for publication. Most members are developing themselves in this way and some are still struggling.’
(Faculty member, UCC)

The need for infrastructure in West African universities is directly related to capacity building. Whether respondents are early career researchers or senior faculty members, ICT material for academics, access to a stable internet connection, access to international academic journals, acceptable offices, as well as research laboratories with minimum equipment, are needed and recommended:

‘We must equip laboratories with minimum equipment and finance research projects in order to motivate researchers.’ (Faculty member, UFHB)

‘For faculty members in the School, we are limited by space. Look at my office, I have to share it with another colleague, and that is not comfortable.’ (Faculty member, UCC)

While the relative lack of infrastructure in West African universities was not caused by the COVID-19 pandemic, the latter, by forcing an unprepared transition to online and ICT tools to support education, learning and research, has exacerbated the need for ICT materials and research equipment.

● Research funding

Funding research is one of the most important challenges facing academics in West African universities. In addition, our data shows that to fund their research activities, researchers at UFHB and UCC rely mainly on private resources and COVID-19 has severely impacted those. The latter observations must prompt decision-makers to increase budget allocation for research and ensure that funds are used accordingly:

'I think the institution should ensure that we have enough funds for research.' (Head of Department, UCC)

'Ensure funding for the research work of students and early career researchers.' (Faculty member, UFHB)

Even more alarming is the situation of early career researchers such as doctoral students, who mostly are self-financing their research and moreover do not have fixed-term contracts since there are still students:

'It is difficult to pay for my study. If scholarships can be provided, it would help us a lot.' (PhD Student, UCC)

'We need funding and financial assistance to students for carrying out their research.' (Faculty member UFHB)

Another recommendation to officials in West African universities is to ensure that doctoral studies are fully funded, as is observed in other geographies. For international development agencies and research funders, the plea is for local representation that disseminates 'calls for proposals' and 'less stringent requirements in meeting research grants' (faculty member, UCC). Furthermore, besides regular calls for proposals, provision of ad hoc funding for promising/priority research topics identified by the local researchers themselves would be ideal. All of these considerations are needed to help West African researchers to be aware of and to understand the mechanisms for obtaining international public and private funding for research.

● Research culture and career support

Our final recommendation concerns the prevailing general lack of research culture and career support in these West African universities, which has further aggravated the impact of the COVID-19 pandemic. In an environment where most researchers are self-financing their work, the lack of ICT and research materials, and minimal laboratory equipment, can result in the desire to conduct research and contribute to scientific knowledge fading away. This may partly explain why Africa's research response to COVID-19 has been subdued or is almost non-existent. As suggested by many respondents in this study, university officials are encouraged to develop an appropriate research culture by providing funds to motivate researchers to initiate innovative research projects, by promoting (funding for) research collaborations within and between universities and compensating for high-level publications.

Regarding career support, contrary to faculty members who did not experience changes in their situation, our study indicates that early career researchers who graduated during the pandemic face uncertainties to transition to academic jobs. Therefore, we encourage West African university officials to introduce targeted solutions to ensure a smooth transition of young graduates into academia. Such solutions could include mentoring programmes or non-permanent positions for young graduates, such as postdoctoral positions.

Lastly, although our research data is based on case studies from two public universities in two West African countries, the findings and recommendations could be relevant to other universities, countries and regions in Africa.

6.3 Evidence gaps and future research opportunities

This study investigated the effects of the COVID-19 pandemic on West African higher education and research institutions, by focusing on the case of two public universities: UFHB (Côte d’Ivoire) and UCC (Ghana). Like any research work, it has some shortcomings, as previously mentioned (Section 5), but has also provided recommendations from the study respondents, to help improve the existing situation. Furthermore, the authors of this report have identified some evidence gaps that could be addressed through future research/investigations (subject to funding). Some of these potential research topics are listed below:

- COVID-19, drop-out, and changes in career path of doctoral students: our data collection process involved early career researchers and PhD students, who mostly self-finance their research. Also, in addition to existing works, this report indicates that the COVID-19 pandemic has exacerbated financial challenges for academics. Therefore, further research focusing on drop-out among PhD-students and changes in their career ambitions may help understand how policymakers and research funders could support West African early-career researchers to achieve their ambitions;
- the transition from school-to-work during the COVID-19 pandemic: compared to industrialised countries, it is well-known that the school-to-work transition takes longer in developing countries. In West African countries, where research works on the topic are almost inexistent, understanding the school-to-work transition and how the latter has been affected by the COVID-19 pandemic seems opportune from both research and policy perspectives;
- COVID-19, quality of teaching, and learning outcome: Our review of the existing literature showed that there is limited evidence on how the pandemic has affected the quality of teaching in higher education institutions overall. In sub-Saharan Africa, very scarce are empirical studies that could be identified on the topic, if any. Therefore, future research, aimed at providing evidence for improving the quality of education in West African HEIs, could investigate the interconnection between the quality of teaching and learning outcome, and how the COVID-19 pandemic has affected that.

References

- Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*, 1–13.
- Agaba, J. (2020). Private universities worry about losing students and staff. *University World News The Global window on Higher Education*.
- Agormedah, E. K., Henaku, E. A., Ayite, D. M. K., & Ansah, E. A. (2020). Online learning in higher education during COVID-19 pandemic: A case of Ghana. *Journal of Educational Technology and Online Learning*, 3(3), 183–210.
- Alam, A., Rampes, S., & Ma, D. (2021). The impact of the COVID-19 pandemic on research. *Transl Perioper & Pain Med*, 8(1), 312–314.
- Ali, S., Miqdad, A., & Saverio, S. (2020). COVID-19 and inequality: are we all in this together? *Canadian Journal of Public Health*, 111(3), 415–416.
- Almazova, N., Krylova, E., Rubtsova, A., & Odinskaya, M. (2020). Challenges and opportunities for Russian higher education amid COVID-19: Teachers' perspective. *Education Sciences*, 10(12), 368.
- Apergis, E., & Apergis, N. (2021). The impact of COVID-19 on economic growth: evidence from a Bayesian Panel Vector Autoregressive (BPVAR) model. *Applied Economics*, 1–13.
- Bianchi, F., Dama, E., Di Nicolantonio, F., Baldassarre, G., Guerriero, I., Torchiario, E., . . . others (2021). COVID-19 epidemic strongly affected cancer research in Italy: a survey of the Italian Cancer Society (SIC). *ESMO open*, 6(3), 100165.
- Bokolo, A. J. (2021). Examining the Adoption of Emergency Remote Teaching and Virtual Learning During and After COVID-19 Pandemic.
- Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education*, 15(1), i–vi.
- Burki, T. K. (2021). Cuts in cancer research funding due to COVID-19. *The Lancet Oncology*, 22(1), e6.
- Carr, R. M., Lane-Fall, M. B., South, E., Brady, D., Momplaisir, F., Guerra, C. E., . . . Hamilton, R. (2021). Academic careers and the COVID-19 pandemic: Reversing the tide. *Science Translational Medicine*, 13(584).
- Chand, A. A., Lal, P. P., & Chand, K. K. (2021). Remote learning and online teaching in Fiji during COVID-19: The challenges and opportunities. *International Journal of Surgery*, 92, 106019.
- Dahdouh-Guebas, F., & Vandebroek, I. (2020). Impacts of the COVID-19 pandemic on mobility scholars who participate in international study exchange and research programs. *Ethnobiology and Conservation*, 10.
- Dang, H.-A. H., & Viet Nguyen, C. (2021). Gender inequality during the COVID-19 pandemic: Income, expenditure, savings, and job loss. *World Development*, 140, 105296.
- Daniel, J. (2020). Education and the COVID-19 pandemic. *Prospects*, 49(1), 91–96.
- Diéguez-Campa, C. E., Pérez-Neri, I., Reyes-Terán, G., Flores-Apodaca, I. A., Castillo-Ledón-Pretelini, J., Mercado-Bautista, O., . . . Lee, Á. (2020). The 2020 research pandemic: A bibliometric analysis of publications on COVID-19 and their scientific impact during the first months. *Archivos de Cardiología de México*.
- Doucet, A., Netolicky, D., Timmers, K., & Tuscano, F. J. (2020). About Pedagogy in an

Unfolding Pandemic.

- Doumbia, S., Sow, Y., Diakite, M., & Lau, C.-Y. (2020). [Coordinating the research response to COVID-19: Mali's approach.](#) *Health Research Policy and Systems*, 18(1), 1–7.
- Doyle, O. (2020). [COVID-19: Exacerbating educational inequalities.](#) *Public Policy*.
- ESSA. (2020). [Learning in Crisis: COVID-19 pandemic response and lessons for students, faculty and Vice Chancellors in sub-Saharan Africa.](#)
- EURAXESS. (2020). [Results of the Survey: Researcher mobility in a changing world Part 1: Analysis of overall survey responses.](#)
- Finardi, K. R., & Guimaraes, F. F. (2020). [Internationalization and the Covid-19 Pandemic: Challenges and Opportunities for the Global South.](#) *Journal of Education, Teaching and Social Studies*, 2(4), 1–15.
- Fornari, L. F., Lourenço, R. G., Oliveira, R. N. G. d., Santos, D. L. A. d., Menegatti, M. S., & Fonseca, R. M. G. S. d. (2021). [Domestic violence against women amidst the pandemic: coping strategies disseminated by digital media.](#) *Revista Brasileira de Enfermagem*, 74.
- Fuentes, R., Galeotti, M., Lanza, A., & Manzano, B. (2020). [COVID-19 and climate change: a tale of two global problems.](#) *Sustainability*, 12(20), 8560.
- Golden, C. (2020). [Remote teaching: The glass half-full.](#) *Educause Review*.
- Goolam, M. (2020). [COVID-19: What consequences for higher education?](#) University World News The Global window on Higher Education.
- Grammes, N., Millenaar, D., Fehlmann, T., Kern, F., Böhm, M., Mahfoud, F., & Keller, A. (2020). [Research output and international cooperation among countries during the COVID-19 pandemic: Scientometric analysis.](#) *Journal of Medical Internet Research*, 22(12), e24514.
- Gwenzi, W., & Rzymiski, P. (2021). [When silence goes viral, Africa sneezes! A perspective on Africa's subdued research response to COVID-19 and a call for local scientific evidence.](#) *Environmental Research*, 194, 110637.
- Harper, L., Kalfa, N., Beckers, G., Kaefer, M., Nieuwhof-Leppink, A., Fossum, M., . . . others (2020). [The impact of COVID-19 on research.](#) *Journal of pediatric urology*, 16(5), 715.
- Hedding, D. W., Greve, M., Breetzke, G. D., Nel, W., & Van Vuuren, B. J. (2020). [COVID-19 and the academe in South Africa: Not business as usual.](#) *South African Journal of Science*, 116(7-8), 1–3.
- Herman, E., Nicholas, D., Watkinson, A., Rodríguez-Bravo, B., Abrizah, A., Boukacem-Zeghmouri, C., . . . others (2021). [The impact of the pandemic on early career researchers: what we already know from the internationally published literature.](#) *Profesional de la Información*, 30(2).
- Heyd, T. (2021). [Covid-19 and climate change in the times of the Anthropocene.](#) *The Anthropocene Review*, 8(1), 21–36.
- Hsiao, C.-C., Huang, J. C., Huang, A. Y., Lu, O. H., Yin, C., & Yang, S. J. (2019). [Exploring the effects of online learning behaviors on short-term and long-term learning outcomes in flipped classrooms.](#) *Interactive Learning Environments*, 27(8), 1160–1177.
- Kaloo, R. C., Mitchell, B., & Kamalodeen, V. J. (2020). [Responding to the COVID-19 pandemic in Trinidad and Tobago: challenges and opportunities for teacher education.](#) *Journal of Education for Teaching*, 46(4), 452–462.
- Kaup, S., Jain, R., Shivalli, S., Pandey, S., & Kaup, S. (2020). [Sustaining academics](#)

- during COVID-19 pandemic: the role of online teaching-learning. *Indian Journal of Ophthalmology*, 68(6), 1220.
- Khan, Z. H., & Abid, M. I. (2021). Distance learning in engineering education: Challenges and opportunities during COVID-19 pandemic crisis in Pakistan. *The International Journal of Electrical Engineering & Education*, 0020720920988493.
- Kokutse, F. (2020). Ongoing closures threaten viability of private universities. *University World News The Global window on Higher Education*.
- Liang, Z., da Costa Junior, M. G., & Piumarta, I. (2020). Opportunities for improving the learning/teaching experience in a virtual online environment. In *2020 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TAL)* (pp. 243–250).
- Maas, B., Grogan, K. E., Chirango, Y., Harris, N., Liévano-Latorre, L. F., McGuire, K. L., ... others (2020). Academic leaders must support inclusive scientific communities during COVID-19. *Nature ecology & evolution*, 4(8), 997–998.
- Mahmud, M., & Riley, E. (2021). Household response to an extreme shock: Evidence on the immediate impact of the Covid-19 lockdown on economic outcomes and well-being in rural Uganda. *World Development*, 140, 105318.
- Marinoni, G., Van't Land, H., & Jensen, T. (2020). The impact of Covid-19 on higher education around the world. *IAU Global Survey Report*.
- Mawazo-Institute. (2020). *Survey report: The impact of covid-19 on Africa's higher education system*. Mawazo Institute.
- Mbonyinshuti, J. (2020). Private universities worry about losing students and staff. *University World News The Global window on Higher Education*.
- Meiksin, J. (2020). *Government funding ramps up COVID-19 research around the globe*. Springer.
- Menon, K., & Motala, S. (2021). Pandemic Leadership in Higher Education: New Horizons, Risks and Complexities. *Education as Change*, 25, 19–pages.
- Molchanova, E., Kovtoniuk, K., & Savych, O. (2020). Covid-19 Presents New Challenges and Opportunities to Higher Education. *Revista Romaneasca pentru Educatie Multidimensionala*, 12(2Sup1), 168–174.
- Neuwirth, L. S., Jović, S., & Mukherji, B. R. (2020). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education*, 1477971420947738.
- NIH, U. S. (2020). *Estimates of Funding for Various Research, Condition, and Disease Categories (RCDC)*.
- Nowakowska, J., Sobocińska, J., Lewicki, M., Lemańska, Z., & Rzymiski, P. (2020). When science goes viral: The research response during three months of the COVID-19 outbreak. *Biomedicine & Pharmacotherapy*, 129, 110451. doi: <https://doi.org/10.1016/j.biopha.2020.110451>
- Nurunnabi, M., Almusharraf, N., & Aldeghaither, D. (2020). Mental health and well-being during the COVID-19 pandemic in higher education: Evidence from G20 countries. *Journal of Public Health Research*, 9(Suppl 1).
- Omeluzor, S. U., Nwaomah, A. E., Molokwu, U. E., & Sambo, A. S. (2021). Dissemination of information in the COVID-19 era in university libraries in Nigeria. *IFLA Journal*, 03400352211037700.
- Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New*

- England Journal of Medicine*, 383(6), 510–512.
- Pokhrel, S., & Chhetri, R. (2021). [A literature review on impact of COVID-19 pandemic on teaching and learning](#). *Higher Education for the Future*, 8(1), 133–141.
- Radecki, J., & Schonfeld, R. (2020). [The Impacts of COVID-19 on the Research Enterprise](#). *Ithaca S+ R*.
- Sánchez, O. R., Vale, D. B., Rodrigues, L., & Surita, F. G. (2020). [Violence against women during the COVID-19 pandemic: An integrative review](#). *International Journal of Gynecology & Obstetrics*, 151(2), 180–187.
- Sawahel, W. (2021). [Political will needed to create the ideal post-pandemic university](#).
- Souza, A. S. R., Fernandes, A. S., Vanderlei, L. C. d. M., Costa, A. A. R. d., Ferreira, A. L. C. G., Dubeux, L. S., ... Cabral, J. E. (2021). [Transparency in research and publications on COVID-19](#). SciELO Brasil.
- Subbaraman, N., & Witze, A. (2020). [Trump to suspend new visas for foreign scholars](#). *Nature*.
- Tagliafico, A., Albano, D., Torri, L., Messina, C., Gitto, S., Bruno, F., ... Sconfienza, L. (2021). [Impact of coronavirus disease 2019 \(COVID-19\) outbreak on radiology research: An Italian survey](#). *Clinical Imaging*, 76, 144–148.
- Tamrat, W. (2021). [Enduring the impacts of COVID-19: experiences of the private higher education sector in Ethiopia](#). *Studies in Higher Education*, 46(1), 59-74.
- UNESCO. (2020). [Global Education Coalition: COVID-19 Education Response](#).
- University of Ghana. (2020). [Update on University of Ghana Online Teaching and Learning](#). UG Website.
- van Schalkwyk, F. (2021). [Reflections on the public university sector and the covid-19 pandemic in South Africa](#). *Studies in Higher Education*, 46(1), 44–58.
- Vitae. (2020). [The impact of the Covid-19 pandemic on researchers in universities and research institutes—Vitae Website](#).
- Watermeyer, R., Crick, T., Knight, C., & Goodall, J. (2021). [COVID-19 and digital disruption in UK universities: Afflictions and affordances of emergency online migration](#). *Higher Education*, 81, 623–641.
- Will, G., Becker, R., & Weigand, D. (2020). [COVID-19 lockdown during field work](#). In *Survey research methods* (Vol. 14, pp. 247–252).
- Woolston, C. (2020). [Pandemic darkens postdocs' work and career hopes](#). *Nature*, 585(7824), 309–312.
- Woolston, C. (2021). [How COVID-19 has stomped on scientists' travel plans](#). *Nature*, 613–615.