THE IMPACT OF COVID-19 ON TEACHING MODELS AND THE SUPPLY AND DEMAND OF FACULTY IN THE EAST AFRICAN COMMUNITY

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About The Report

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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, policy-makers) 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 All-Africa Students Union, Association of African Universities, Decent Jobs for Youth, Ghana Tertiary Education Commission, Inter-University Council for East Africa, Population Reference Bureau, Quilt.AI, UNESCO, UNHCR and Zizi Afrique Foundation, 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 about the organisation, please contact Pauline Essah (Director of Research and Insight; pauline@essa-africa.org) or Lucy Heady (CEO; lucy@essa-africa.org).
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Executive Summary

This report has been prepared by ESSA to feed into a study about the Demographics of African Faculty (DAF) in the East African Community (EAC). The report presents the effects of the COVID-19 pandemic on faculty challenges in the EAC. The DAF EAC project is being undertaken by an international consortium comprising of the Inter-University Council of East Africa (IUCEA), Education Sub Saharan Africa (ESSA), the Association of African Universities (AAU), and Population Reference Bureau (PRB).

The evidence and insights in this report, regarding the impact of covid-19 on teaching models and the supply and demand of faculty in the EAC, are intended to be useful for tackling faculty challenges in the EAC region. It will help the consortium to refine its methodology for engaging with higher education stakeholders, identify and/or co-create new solutions to address the faculty challenges exacerbated by the pandemic, and engage with education leaders and policy-makers in tackling the challenges and embracing new opportunities presented by the pandemic.

In March 2020, most governments in the EAC suspended in-person activities including those of Higher Education Institutions (HEIs) to stop the spread of the virus. The COVID-19 pandemic came at a time when HEIs and stakeholders in the education sector had been employing different strategies to address faculty challenges and transform higher education in SSA. The closures led to the adoption of different teaching models such as distance, online, and or blended learning to continue teaching and learning. Nevertheless, this shift occurred with little to no preparation in skills and infrastructure.

Understanding the impact of covid-19 on teaching models and the supply and demand of faculty in the EAC is needed to develop and co-create effective strategies and new solutions for addressing faculty challenges identified in the region. As a first step in achieving this objective, ESSA has conducted a quantitative analysis on a survey commissioned by Inter University Council of East Africa (IUCEA) and Education Sub-Saharan Africa (ESSA). The survey documented experiences of HEIs and faculty members in the EAC region during the COVID-19 pandemic. The next step is for the DAF EAC consortium to further enhance the quantitative research evidence, by conducting interviews or focus group discussions with higher education stakeholders.

The analysis observed the following:

1. Across the region, most HEIs experienced challenges transitioning to eLearning due to a lack of ODeL (Open and Distance Learning) policies. As a result, faculty and students lacked the skills, internet connectivity, ICT (Information Communication Technologies) gadgets, and reluctance to transition – as detailed in section 3.1.

1 The numbers of faculty by age, gender, field/department, role, and rank
2. HEIs responded to the challenges by downward adjustment of salaries, designing long distance learning programmes, negotiating with suppliers, negotiating for internet bundles with service providers, training faculty and students on eLearning, and forming COVID-19 crisis committees. More information is presented in section 3.2.

3. In the wake of the pandemic, only Tanzania and Burundi had a significant high proportion of in-person classes across the region. However, on the new teaching models across the region, 24% adopted eLearning, 7% distance learning, and 44% blended learning, with Burundi and Tanzania having a low uptake. See section 3.2 for more information.

4. Across the region, the study finds that countries and HEIs that trained their faculty on the adoption of eLearning and provided their faculty members with internet, increases their probability of using eLearning and blended learning – as detailed in section 3.2

5. On average across the EAC, 45% of the study’s faculty respondents remained permanently employed, and 9% were on a contract basis. Burundi had the lowest faculty members who remained permanent at 30% – as presented in section 3.4

6. Only half of the study’s faculty respondents in Kenya and Tanzania were paid their salaries on time. In Uganda, this accounted for 17%. Also, Ugandan faculty members experienced the highest pay cuts, reduced benefits, and their benefits were not remitted on time. Further, across the region, the lack of institutional support from HEIs increases the probability of having pay cuts, reduced benefits, and retrenchment fear. See section 3.5

7. Except for Burundi and Tanzania, which averaged at 20%, the other countries embarked on training their faculty on eLearning. Uganda stands out in provision of internet bundles to faculty members at 38% with the region average being 21%. See section 3.7 for more information.

8. On average, EAC faculty reported increased workload (lecture hours) by 32%, with Rwanda leading by 53% as presented in section 3.8.

9. Faculty members in Kenya, Rwanda, and Tanzania reported spending more time preparing and teaching. However, overall, faculty members did not feel that eLearning is cumbersome. Rwanda and Uganda faculty members think that eLearning is ineffective by 47% and 38%, respectively. The regional average is 31%. More information is presented in section 3.9

10. On average, only a small percentage (16%) of exams were administered online. However, Rwanda and Uganda offered most of their exams in a blended way by 41% and 37%, respectively. Tanzania’s lack of strict lockdowns had most of their exams administered in-person. This is explained in section 3.10.

11. The probability of online exams systems failure is increased by HEIs lack of preparedness for online exams and lack of internet access. However, training students and faculty on eLearning decreases the probability of exam failure by 29 percentage points, as explained in section 3.11.

12. The probability of HEIs having difficulty upholding exam integrity is increased by unstable internet connection, which also increases the likelihood of making marking of online exams cumbersome. Across the region, Kenya and Uganda have the highest number of
HEIs who have difficulty upholding the integrity of online exams by 27% and 31%, respectively against a regional average of 24%. More information is also presented in section 3.11.

13. Across the region, Burundi and Tanzania had the lowest numbers (below 10%) of students and faculty trained on online exams. Further, all countries in the region had very little to no equipment to ensure the integrity of online exams as presented in section 3.12.

14. Across the EAC, more than 70% of faculty members did not research during the pandemic, less than 25% published. However, on a positive note, less than 5% of research projects got suspended – as presented in section 3.13.

15. Across the region, faculty research was reduced by the intensive work involved in eLearning, lack of research funds, suspension of research projects, and being female. In addition, the probability of publishing during the pandemic was also reduced by intensive work involved in eLearning and lack of research funds. This is discussed in more detail in section 3.14.

16. On average, 18% of the faculty across the region did not attend personal development meetings, 11% feared retrenchment, and 20% had their research funds reduced. The pandemic delayed faculty promotion by 9% across the region and 24% in Rwanda. Some faculty relocated due to the high cost of living, and 50% of the faculty respondents in Uganda reported financial difficulties providing for their families, with most of them venturing into alternative sources of income. This is explained in section 3.15.

17. On average, 14% of faculty members in the region reported having experienced depression. Uganda reported the highest levels of loneliness. However, only 5% of faculty in the region attended counselling services. More information is presented in section 3.16.

18. Across the EAC, there was a reduction in student enrolment, especially in Kenya, Rwanda, and Uganda. Kenya had the highest decrease in international student recruitment. Also, on average, 23% of international students in the region suspended their studies. In addition, Kenya and Uganda led in suspending exchange programs – as presented in section 3.17 and 3.18.
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA</td>
<td>Sub-Saharan Africa</td>
</tr>
<tr>
<td>HEIs</td>
<td>Higher Education Institutions</td>
</tr>
<tr>
<td>ICT</td>
<td>Information Communication Technology</td>
</tr>
<tr>
<td>IUCEA</td>
<td>Inter University Council of East Africa</td>
</tr>
<tr>
<td>ODeL</td>
<td>Open Distance and eLearning</td>
</tr>
<tr>
<td>ESSA</td>
<td>Education Sub Saharan Africa</td>
</tr>
<tr>
<td>AAU</td>
<td>Association of African Universities</td>
</tr>
<tr>
<td>PRB</td>
<td>Population Reference Bureau</td>
</tr>
<tr>
<td>EAC</td>
<td>East African Community</td>
</tr>
<tr>
<td>DAF</td>
<td>Demographics of African Faculty</td>
</tr>
</tbody>
</table>
1. Introduction

Approximately 98% of tertiary level students — roughly 8.4 million, were out of school in sub-Saharan Africa (SSA) at some point during the COVID-19 pandemic (World Bank, 2020). In March 2020, most governments in the EAC suspended in-person activities including those of Higher Education Institutions (HEIs). At the onset, most HEIs did not have Open Distance and eLearning (ODeL) policies and adequate ICT infrastructure. Additionally, lecturers and students have had to grapple with new technologies, changes in lifestyles, and livelihoods. These have negatively impacted faculty members’ physical and mental health as they cope with confined lives during the pandemic, which may further negatively impact the quality of education students receive in the region (Idris et al., 2021).

The economic shutdowns have also led to revenue shortfalls from low student enrolment, defaultment in fees payment, and or reduction in government funding of HEIs. This may affect faculty recruitment, retention, and development. In addition, the magnitude of these challenges by region, country, and gender is poorly understood. Despite these challenges, the pandemic has brought in new opportunities that necessitates policy-makers and stakeholders to rethink how to effectively deliver quality tertiary education in an inclusive and equitable manner, and the role of technology as a key enabler. To capitalize on these new opportunities, the magnitude of the pandemic’s challenges by region and country is needed for effective planning and response.

Despite these myriad challenges, the pandemic has required higher education stakeholders to rethink the use of technology in delivering quality higher education inclusively and equitably. Therefore, to counter these challenges, a clear understanding of the scale and nature of the faculty challenges is vital in planning and implementing an effective response.

2. Methodology

The study utilized a survey commissioned by Inter University Council of East Africa (IUCEA) and Education Sub-Saharan Africa (ESSA) that documented experiences of HEIs and faculty members in the EAC region during the COVID-19 pandemic. The respondents included Ministry of Education officials, HEI regulatory bodies, managers of HEIs, faculty and administrative staff, and students.

The survey’s sample consisted of 133 HEIs, both public and private, that are members of the IUCEA as presented in Table 1 below. It is important to note that private institutions constitute almost twice as much as public institutions. From each institution, data was collected from the Vice-chancellor or Principal, Academic staff, administrative staff, and students.
The survey was carried out online from April 12, 2021, to June 14, 2021. Most of the countries in the EAC had instituted COVID-19 containment measures except for Burundi and Tanzania. A total of 1,658 respondents participated, translating into an average completion rate of 52%. The percentage composition of respondents across categories is presented in Figure 1 below where student and faculty/administrative staff constitute over 90% of respondents.

Figure 1: Respondents distribution across categories

In analyzing the primary data, the study employed descriptive statistics and probability regression models (probit)\(^2\) to assess the impact of COVID-19 on teaching models and supply and demand of faculty in the EAC. We present the marginal effects in figures\(^3\), which show the change in probability when the predictor or explanatory variable increases by one unit.

3. Study Findings
This section presents the study findings from the primary survey data.

\(^2\) Having binary outcomes, a probit model estimates the probability a value will fall into one of the two possible binary outcomes. Ordinary Least Squares (OLS) and Linear Probability Models (LPM) violates several assumptions of OLS regression and results from hypothesis tests will be invalid (Long, 1997).

\(^3\) Tables of regression results are in the appendix.
3.1 Transition to eLearning

Across the region, most HEIs experienced challenges transitioning to eLearning. In Table 2, the study finds that on average across the region, some of the challenges included lack of ODeL policies (50%); lack of skills; connectivity; equipment to transition by students (63%) and faculty (38%); and reluctance to transition by faculty (19%) and student (47%).

<table>
<thead>
<tr>
<th>Immediate challenges hampering transition into eLearning</th>
<th>% Of HEIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of our students lacked skills, internet connectivity, equipment to transition to eLearning</td>
<td>63</td>
</tr>
<tr>
<td>We did not have an ODeL policy in place</td>
<td>50</td>
</tr>
<tr>
<td>We needed to have our online resources accredited by our regulator</td>
<td>47</td>
</tr>
<tr>
<td>We did not get immediate clear guidance from our regulators</td>
<td>47</td>
</tr>
<tr>
<td>Most of our students were reluctant to move into eLearning</td>
<td>47</td>
</tr>
<tr>
<td>Most of our staff lacked skills, internet connectivity, equipment to transition to eLearning</td>
<td>38</td>
</tr>
<tr>
<td>We did not have the financial resources to invest in eLearning platform</td>
<td>34</td>
</tr>
<tr>
<td>We did not have an eLearning platform in place</td>
<td>28</td>
</tr>
<tr>
<td>Most of our faculty were reluctant to move into eLearning</td>
<td>19</td>
</tr>
<tr>
<td>We did not get proper guidance from our governing council</td>
<td>13</td>
</tr>
<tr>
<td>We did not have staff with the technical knowledge to guide us in the transition to online</td>
<td>13</td>
</tr>
<tr>
<td>Other challenges</td>
<td>9</td>
</tr>
</tbody>
</table>

HEIs response to the above challenges included downward adjustment of salaries to stay afloat; designing long distance learning programmes; negotiating with suppliers (4%); negotiating for internet bundles with service providers (12%); training faculty and students on eLearning (16%); and forming COVID-19 crisis committee (16%) as shown in Figure 2 below.

![Figure 2: Response by Heads of HEIs](image)

3.2 Teaching models

In the wake of the pandemic, except Tanzania and Burundi, most of the countries in EAC went into a complete lockdown. This meant that HEIs had to find new teaching models. In Figure 3, the study finds that more than half of classes in Tanzania were in-person, this was followed by
Burundi at 28%. The rest of the countries\textsuperscript{4} averaged below 20%. On average, 24% adopted eLearning, 7% distance learning, and 44% blended learning with Burundi and Tanzania having a low uptake.

\textbf{Figure 3: Teaching models during the pandemic}

Across the region, the study finds that countries and HEIs that trained their faculty on the adoption of eLearning and provided their faculty members with internet, increases their probability of using eLearning and blended learning by 15 percentage points and 31 percentage points respectively as shown in Figure 4. In addition, HEIs that provided their faculty with internet bundles increased their probability of eLearning and blended learning by 11 percentage points and 24 percentage points respectively. Gender is not a determinant in institutional support in adopting eLearning and blended learning.

\textsuperscript{4} Due to small sample size and low statistical power, we excluded South Sudan from our analysis.
Figure 4: Institutional determinants of teaching model adoption

Notes: The figure plots the coefficients and the 95% confidence intervals. The coefficients are estimated from a probability regression model. This means that in 95 out of 100 samples, our estimated mean will fall within this range. Therefore, the true mean has a 95% chance of falling within this range.

3.3 Mode of delivery
For a successful eLearning adoption, the necessary infrastructure is needed. Across the region, there was a high uptake in the use of Zoom, Googlemeet and institutional learner management as opposed to Microsoft Teams as shown in Figure 5. Teams was only widely used in Rwanda. The choice of these mode of delivery may be attributed to their cost. However, it is important to point that Burundi and Tanzania had a low uptake of institutional learner management by 5 percent and 14% respectively.
3.4 Faculty employment
The economic shutdowns, reduction in tertiary education budgets, and low student enrollments pushed many HEIs into financial difficulties. Consequently, faculty members' employment terms were also affected. In Figure 6, on average, 45% of the study’s faculty respondents remained permanently employed and 9% were on contract basis. Burundi had the lowest faculty members who remained permanent at 30%.

Figure 5: Mode of delivery

While we do not have the % before the pandemic, the survey asked “Indicate what happened with regard to employment of faculty after resumption of learning”
3.5 Salary and Benefits
The financial constraints can also translate into reduction in pay and benefits. From figure 7, we find that only 50% of faculty in Kenya and Tanzania had their salary paid on time, with only 17% of Ugandan faculty members salary been paid on time. Further, Ugandan faculty members experienced the highest pay cuts, reduced benefits, and their benefits were not remitted on time.
Support from one’s institution is a key determinant in salary and benefits remittance. In Figure 8 we find that, across the region, the lack of institutional support from the HEIs increases the probability of having pay cuts and reduced benefits by 13 percentage points and increases retrenchment fear by 7 percentage points. Mostly, no significant gender effect was observed regarding salary and benefits.

*Figure 7: Faculty salary and benefits*
Figure 8: Probability of institutional support and gender on faculty salary and benefits

Notes: The figure plots the coefficients and the 95% confidence intervals. The coefficients are estimated from a probability regression model. This means that in 95 out of 100 samples, our estimated mean will fall within this range. Therefore, the true mean has a 95% chance of falling within this range.

3.6 Faculty challenges to eLearning

The transition to eLearning has had its fair share of challenges, not only to the students, but also to faculty members. In Figure 9, on average, the study finds that most of the surveyed faculty members had adequate eLearning skills. Across the region, 41% of faculty members had unreliable internet connection and 29% had inadequate electronic gadgets for eLearning. 53% of Rwandan and Ugandan faculty members reported unreliable internet connection.
Inadequate eLearning skills

No institutional facilitation

Unreliable internet connection

Inadequate electronic gadgets

Figure 9: Faculty challenges to eLearning

3.7 Institutional response to eLearning challenges

Response from HEIs on the above eLearning challenges is crucial for the provision of quality and equitable education during the pandemic. From Figure 10, we find that except Burundi and Tanzania who averaged at 20%, the other countries embarked on training their faculty on eLearning. Uganda stands out in provision of internet bundles to faculty members at 38% with the region average being 21%. On average, 22% of the region’s faculty could access the institutions premises with internet access. Consequently, most of the countries in the region did not provide faculty allowance to facilitate eLearning.
3.8 Faculty workload
Navigating the new teaching tools and ensuring quality and equity in education delivery, faculty members may have increased workload in terms of increased lecture hours. In Figure 11, on average, EAC faculty reported increased workload (lecture hours) by 32%, with Rwanda leading by 53%. The increased workload may be countered by increased pay to motivate faculty members. However, less than 25% had their salary increased due to increased workload except Burundi and Tanzania who averaged less than 5%.
3.9 Perceptions on eLearning

Most of the faculty members were prepared for eLearning, with those reporting not being prepared averaging 17% in the region. Faculty members in Kenya, Rwanda, and Tanzania reported to spend more time preparing and teaching. However, overall faculty members did not feel that eLearning is cumbersome. Rwanda and Uganda faculty members feel that eLearning is not effective by 47% and 38% respectively. The regional average is 31%.
Despite most countries in the region adopting eLearning, on average, only a small percentage (16%) of exams were administered online. However, Rwanda and Uganda offered most of their exams in a blended way by 41% and 37% respectively. Tanzania’s lack of strict lockdowns had most of their exams administered in-person.

**Figure 12: eLearning effectiveness**

### 3.10 Administration of exams

Despite most countries in the region adopting eLearning, on average, only a small percentage (16%) of exams were administered online. However, Rwanda and Uganda offered most of their exams in a blended way by 41% and 37% respectively. Tanzania’s lack of strict lockdowns had most of their exams administered in-person.
3.11 Integrity of online exams

One of the major challenges of administering online exams is how to maintain exam integrity. Across the region, in Figure 14, this analysis finds that the probability of online exams systems failure is increased by HEIs lack of preparedness for online exams by 10 percentage points, lack of internet increases also increases the probability of online exams systems failure by 9 percentage points. However, training students and faculty on eLearning decreases the probability of exam failure by 29 percentage points. The likelihood of HEIs having difficulty in upholding exam integrity is increased by unstable internet connection by 16% which also increases the probability of marking of online exams cumbersome. Consequently, lack of internet access, electronic gadgets and poor transition to eLearning increased the likelihood of faculty members having an increased workload. Across the region, Kenya and Uganda have the highest number of HEIs who have difficulty upholding integrity of online exams by 27% and 31% respectively against a regional average of 24% as shown in Figure 15.
Figure 14: Probability of online exams systems failure, upholding exam integrity and cumbersome exam marking under lack of preparation, internet, gadgets, training, and gender

Notes: The figure plots the coefficients and the 95% confidence intervals. The coefficients are estimated from a probability regression model. This means that in 95 out of 100 samples, our estimated mean will fall within this range. Therefore, the true mean has a 95% chance of falling within this range.
3.12 Online exams training

Across the region, Burundi and Tanzania had the lowest numbers (below 10%) of students and faculty trained on online exams. This can be attributed to the fact that they largely used in-person delivery so online training was not a priority. Further, all countries in the region had very few to no equipment to ensure integrity of online exams as shown in Figure 16.
3.13 Research during pandemic

The pandemic has had negative effects on faculty research. Across the EAC, more than 70% of faculty members did not conduct research during the pandemic, less than 25% published, and less than 5% of researchers reported that their projects got suspended. Further, this was reflected in the attendance of online conferences with 36% of faculty members attending online conference on average as shown in Figure 17.

Figure 16: Students and faculty training on online exams
3.14 Determinants of research during Covid-19

In Figure 18, the study finds that across the region, faculty research was reduced by the intensive work involved in eLearning, lack of research funds, suspension of research project, and being female by 24 percentage points, 19 percentage points, 14 percentage points, and 5 percentage points respectively. Publishing during the pandemic was also reduced by intensive work involved in eLearning and lack of research funds by 20 percentage points and 16 percentage points respectively, which also reduced the probability of attending online conferences by 33 percentage points and 28 percentage points respectively. Also, lack of institutional support during this period increased the likelihood of lack of faculty personal development.
Figure 18: Determinants of research during Covid-19
Notes: The figure plots the coefficients and the 95% confidence intervals. The coefficients are estimated from a probability regression model. This means that in 95 out of 100 samples, our estimated mean will fall within this range. Therefore, the true mean has a 95% chance of falling within this range.

3.15 Challenges to career progress
Faculty members reported that the pandemic delayed faculty promotion by 24% in Rwanda and 9% across the region. On average, 18% of the faculty across the region indicated that they did not attend personal development meeting, 11% feared retrenchment, and 20% had their research funds reduced. These challenges contributed to 10% of the faculty relocating due to high cost of living, 25% reported financial difficulty providing for their family with Uganda leading at 50% of the sampled respondents. To counter this problem, 23% of the faculty members reported to have ventured into alternative sources of income with Uganda leading at 38%. Across the region, 15% of our sample resigned to seek for greener pastures with Uganda leading at 48%.
Figure 19.1: Challenges to career progress
3.16 Mental health
On average, 14% of faculty members in the region reported to have experienced depression, Rwanda had low levels of depression at 6%. Among the respondents, 6% reported loneliness with Uganda reporting high levels of loneliness at 25%. 8% experienced marital strife and only 5% attended counselling.
3.17 Student enrolment
Across the region, on average, students’ recruitment reduced by 23%. The most affected countries were Kenya at 36%, Rwanda at 50%, and Uganda at 42%. Also, international students’ recruitment went down by 27% with Burundi and Uganda at 33%, and Kenya leading at 57%.
3.18 International students and exchange students

Across the EAC, on average, 23% of international students suspended their studies. The affected countries were Kenya at 43%, Rwanda by 50% and Uganda by 33%. Consequently, Kenya and Uganda suspended their exchange programs by 23% and 25% respectively.
4. Conclusion

The analysis from this report shows that the COVID-19 pandemic has had effects on the teaching models and the supply and demand of faculty in the EAC. Some of these effects are:

a) Challenges in transitioning to eLearning due to lack of policies, ICT infrastructure, and skills.
b) Reduction in faculty salaries, delay in salary payments, reduced benefits, benefits not being paid on time, and fear of being retrenched.
c) Increased faculty workload.
d) Online exams system failures and difficulty in upholding exam integrity.
e) Decrease in research output.
f) Reduced attendance in academic conferences and personal development meetings.
g) Increased depression and loneliness.
h) Reduced students’ enrolment, suspension of studies by international students, and suspension of student exchange programs.

These evidence-based observations are important in designing solutions to faculty challenges in the region. Subsequently, the challenges can be turned into opportunities, especially in the use of technology, to improve the quality of higher education for the growing youth population in sub-Saharan Africa. However, education stakeholders need to conduct interviews and focused group discussions to enrich this quantitative analysis.
References


## Appendices

### Table A1: Faculty support in eLearning transition

<table>
<thead>
<tr>
<th></th>
<th>(1) Faculty trained on eLearning</th>
<th>(2) HEI provide faculty internet bundles</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-person</td>
<td>0.055 (0.039)</td>
<td>0.039 (0.037)</td>
</tr>
<tr>
<td>Distance</td>
<td>0.066 (0.043)</td>
<td>0.071 (0.048)</td>
</tr>
<tr>
<td>eLearning</td>
<td>0.145*** (0.035)</td>
<td>0.114*** (0.035)</td>
</tr>
<tr>
<td>Blended</td>
<td>0.313*** (0.022)</td>
<td>0.243*** (0.031)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.001 (0.019)</td>
<td>-0.020 (0.026)</td>
</tr>
<tr>
<td>Year employed</td>
<td>0.000 (0.001)</td>
<td>-0.001 (0.002)</td>
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<tr>
<td>Department</td>
<td>0.000 (0.000)</td>
<td>-0.000 (0.000)</td>
</tr>
<tr>
<td>Citizenship</td>
<td>0.004 (0.045)</td>
<td>-0.021 (0.072)</td>
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<td>-0.033 (0.051)</td>
<td>-0.135 (0.090)</td>
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<td>Rwanda</td>
<td>0.013 (0.065)</td>
<td>-0.131 (0.126)</td>
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<td>Tanzania</td>
<td>-0.061 (0.054)</td>
<td>-0.236** (0.094)</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.002 (0.051)</td>
<td>-0.021 (0.099)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>648</td>
<td>648</td>
</tr>
</tbody>
</table>

*Notes:* Marginal effects after probit regression. Robust standard errors in parentheses clustered at the respondent level. Significance level: *p<0.10, **p<0.05, ***p<0.01
Table A2: Institutional preparedness in eLearning and online exams

<table>
<thead>
<tr>
<th></th>
<th>(1) Increased workload</th>
<th>(2) Online exams system failure</th>
<th>(3) Difficult to uphold online exams integrity</th>
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<td>No gadgets</td>
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<td>0.094***</td>
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<td>(0.026)</td>
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<td>-0.222***</td>
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<td>(0.035)</td>
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<td>(0.129)</td>
</tr>
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<td>0.029</td>
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N 648  648  648

Notes: Marginal effects after probit regression. Robust standard errors in parentheses clustered at the respondent level. Significance level: *p<0.10, ** p< 0.05, ***p< 0.01
Table A3: Research and personal development

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<td>Published</td>
<td>Participate in</td>
<td>Did not attend</td>
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Notes: Marginal effects after probit regression. Robust standard errors in parentheses clustered at the respondent level. Significance level: *p<0.10, ** p< 0.05, ***p< 0.01
Table A4: Faculty salary and benefits

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<th>(1) Salary paid on time</th>
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<th>(3) Benefits reduced</th>
<th>(4) Fear of retrenchment</th>
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<td>0.068**</td>
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<td>(0.029)</td>
<td>(0.034)</td>
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<td>(0.038)</td>
<td>(0.035)</td>
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<td>(0.025)</td>
</tr>
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<td>0.003*</td>
<td>-0.001</td>
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<td>(0.002)</td>
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<td>(0.096)</td>
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N | 648 | 628 | 648 | 620

Notes: Marginal effects after probit regression. Robust standard errors in parentheses clustered at the respondent level. Significance level: *p<0.10, ** p< 0.05, ***p< 0.01