

# CHALLENGES AND OPPORTUNITIES OF MOVING TO ONLINE LEARNING IN THE HIGHER LEARNING INSTITUTIONS IN RWANDA: LESSONS LEARNT DURING COVID -19 PANDEMICS

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## Abstract

*The coronavirus pandemic which started in China in December 2019 has not only created challenges on the health system, but it has had a very big impact on the education systems across the globe. This study analyzed the challenges and opportunities of moving to online learning in the higher learning institutions in Rwanda insight from the lessons learnt during Covid – 19 pandemics on the learning process of students in the higher learning institutions in Rwanda. A quantitative research design was adopted. Primary data was collected from 1170 students in 30 learning students in Rwanda using a closed ended questionnaire. Data was analyzed using descriptive and inferential statistical analytical tools. The results from the survey indicated Covid -19 has impacted the learning process of students in the higher learning institutions in different ways. It has led to change in the academic calendar, suspension of exams, students in the final year unable to do their research and internship, it has affected the quality of learning and lack of learning from peers due to social distancing.*

*The study contributed to the existing knowledge by establishing by establishing the challenges and opportunities of moving to online learning in the higher learning institutions which included learning inequality among the students in rural areas and those from towns and the students from rich families and those from vulnerable families. This research adopted pragmatism research philosophy that allowed them to use both descriptive and inferential statistical data analysis tools*

**Key Terms: Covid – 19, Learning, Education institutions, online learning, Students**

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## 1.0 Introduction

Education is one of the key pillars that African leaders need to concentrate on if they are to achieve the sustainable growth. It is the key that opens the door to the economic growth. Various scholars have indicated the role of education in the economic growth (Nikos and Stefania, 2013, Hanushek, 2016 and Hanushek, 2013). Hanushek (2013) points out that improving schooling is a forefront of many countries in the world. Similarly, Hanushek (2016) points out that the cognitive skills form the foundation for economic growth in the developing countries. Both the neoclassical and endogenous economics try to converge at one points that education forms the foundation for human capital which is core variable in the economic growth. Education inequality continues to be a major challenge in many developing countries where students in rural areas are more marginalized.

Zhang *et al.* (2015) posits that students in the rural area perform lower than students in the urban areas. Human capital is very important factor in the journey of economic growth. Evidence from the previous studies suggests that cognitive skills are fundamental in ensuring economic growth (Hanushek, 2016 and Hanushek, 2013). Without improving the school quality, developing countries will find it difficult to improve their long run economic growth. Improving schooling has been the fore front of many countries especially the developing countries (Hanushek, 2016 and Hanushek, 2013).

Following the outbreak of Covid – 19, the teaching and learning process was shifted from the normal classrooms to the virtual classrooms through the use of various technologies. Although use of mobile learning allows learning to take place at any time and in any place as pointed out by Naciri *et al.* (2020), the infrastructure development to support the online learning is still very low in many education institutions (Bao, 2020, Reimer and Schleicher, 2020, Sintama, 2020). Poor networks have greatly affected the online learning process during the covid – 19 pandemics (Owusu and Hanson, 2020, Joseph *et al.*, 2020). Covid- 19 pandemic has created a big challenge to science students' learning process (Sintama, 2020, Abidah *et al.* 2020 and Peters *et al.*, 2020). The interruption in the learning process was due to lack of virtual lavatories, cadavers, dissection rooms, specimens, skeleton, and lack of practical learning materials as pointed out by (Abidah *et al.*, 2020 and Peters *et al.*, 2020). This has affected mostly science students in their final years. Huston et al (2020) asserts that students doing natural science subjects were unable to have access to laboratories due to lack of

virtual laboratories in many education institutions. More to that, many students lack enough skills to study and practice online (Wargadinata *et al.*, 2020; Owusu *et al.* 2020; Drane *et al.*, 2020; Calhoun, 2020 and Caoa *et al.*, 2020). Owusu and Hanson (2020) points out that students are unable to study effectively at home. Owusu *et al.* (2020) and Drane *et al.* (2020) points out that online learning has got various challenges which includes limited internet connections, unconducive home environment and failure of parents to assist in the learning process, learning from others through group discussion and limited skills to study online.

Whereas literature on the challenges of moving to online learning has been established from different countries by different scholars (Zhanga *et al.*, (2020), Radwan and Radwan, (2020), Connorchick *et al.* (2020), Karalis, (2020) Brown *et al.*, (2020) Reimers and Schleicher, (2020), the evidence to support this literature is still very limited in Rwanda. More to that, most studies that have analysed this phenomenon have used a literature review (Connorchick *et al.* (2020), Zhanga *et al.*, (2020), Ozer (2020) Ogunode *et al.* (2020) Peters *et al.* (2020) and Karalis, (2020) to come up with the conclusion on the impact of covid-19 on the education sector. This study contributed to the existing literature in two important ways; firstly, the study established the impact of covid -19 pandemic on the learning process in Rwanda and secondly, the study added to the methodological approach by adopting pragmatism research philosophy.

## **2.0 Literature Review**

School closure is one of the non-pharmaceutical measures that were introduced to control the spread. Following the outbreak of covid -19 pandemic in Rwanda on 14<sup>th</sup> March 2020 when the patient was identified, the government of Rwanda took measures to control the spread of the virus. The first measures that were announced on 15<sup>th</sup> March 2020 were the closure of schools and churches. These were followed by other measures such social distancing, total lockdown and putting on a face mask. After the closure of schools, education was shifted from schools to home, where the burden of education now falls on parents. Studies highlighting the impact of covid – 19 on the education sector are emerging and none of which is conclusive

The coronavirus pandemic which started in China in December 2019 has not only created challenges on the health system, but it has had a very big impact on the education systems across the globe (Owusu *et al.* 2020, Daniel, 2020; Chan, 2020; Peters *et al.*, 2020 and Karalis, 2020). The measures

which were introduced to combat Covid 19 pandemic such as lockdowns, social distancing and quarantine have disrupted the operation of the education institutions (Daniel, 2020, Ognodi *et al.*, 2020, Reimers and Schleicher, 2020). In order to implement the Covid-19 measures, teaching was shifted from the physical to the virtual classrooms and from schools to home (Zhang *et al.*, 2020). This has not only affected the teaching and learning processes, but as well as the operation of education institutions since many private education institutions survive solely on school fees from students (Karalis, 2020). Wargadinata *et al.* (2020) points out that with the covid -19 measures such as social and physical distancing, online learning appears to be a solution in the situations where the normal learning process cannot take place. Frieland (2020) points out that the pandemic unfolded and offered opportunity to instil the culture of

Zhang *et al.* (2020) analysed on suspending classes without stopping learning focusing on China's education emergence management policy in the covid – 19 outbreaks. A qualitative approach was adopted through review of literature. The findings revealed weakness online teaching infrastructure, inexperienced teachers, unequal learning outcomes created by the inexperienced teachers, information gap, complex environment at home, proportion and efficacy of the use of the online teaching resource are still low, and both teachers and students face a problem of teaching and studying online, unclear teaching mode and pedagogy. Murphy (2020) analysed covid 19 and the emergency of eLearning, consequences of the securitization of higher education for post pandemic pedagogy. The study adopted a qualitative approach through review of literature. Findings show that securitization theory is an important tool for educators not for observing the phenomenon of emergency of eLearning but also advocates the desecuritisation of the schools after covid – 19.

Naciri (2020) the study examined the role of mobile learning as a remote teaching strategy to sustain student centered learning. Findings show that use of mobile learning allows learning any time, any place and any time. Covid – 19 pandemic has had a great impact on the education need to change their education curriculum to adopt innovation teaching. The study identified a big challenge on developing the students' technological skills to use e-learning. Doyle (2020) analysed how covid – 19 exacerbated education inequality with evidence from Ireland. The adopted qualitative systematic review of 45 studies modeling the effect of covid on schools. The findings from the survey revealed that covid – 19 pandemic has widen the education inequality

Owusu and Hanson (2020) examined the impact of covid – 19 pandemic on learning focusing on the Ghanaian students. The study used a descriptive research design. Data was collected using a questionnaire from a population of 214 students from the total institutions. A simple random sampling was used to select the sample. Findings revealed that students were unable to learn effectively from home, online learning is not effective, parents are incapable of assisting their children on how to access the eLearning platform, and don't get time to supervise their children, limited internet access and the technical knowhow.

Wargadinata *et al.* (2020) analysed the students' response on learning in the early covid -19 pandemic in Malang Indonesia. The study adopted both quantitative and qualitative research design and data was collected from both primary and secondary sources using questionnaire, interview and observation. The questionnaire was distributed using online google form and the interview was conducted online. The study population included 225 students from the higher learning institutions. The findings revealed that use of what's-up group was the easiest to communicate to the students since it does not require much data and it is simple to use. Education institutions adopted different learning models in order to ensure learning continues to take place even during the period of covid -19 pandemic. These included what's-up groups, e-learning platforms, Zoom, google classrooms, Microsoft teams, WebEx and others as they develop. Huston et al (2020) examined the impact of covid -19 pandemic on the medical students in the United States of America. The study adopted a qualitative approach by reviewing various literatures. Students were sent home and removed from hospital and clinic settings, shifted from live groups to virtual teaching and this affected students' acquisition of practical skills.

Owusu *et al.* (2020) examined the impact of covid -19 on learning in Ghana. The study adopted a descriptive research design. The study population included 214 students from the tertiary institutions. Data was collected using a questionnaire which was designed using a Likert scale. Findings revealed that students are facing a number of challenges which include students are unable to effectively study from home which makes online learning less effective, parents are not capable of assisting the children during the online learning, limited access to internet, and lack of technological knowhow. Drane *et al.* (2020) analysed the impact of online learning on the educational outcomes of vulnerable children in Australia during the Covid -19 Pandemic. The study adopted a qualitative research approach through review of various research articles. Findings revealed that there are still limited skills in the use of technology during the learning process, limited

internet coverage and lack of internet data, learning from others through group discussion is also limited digital inclusion as the internet coverage is still very limited as well as excess to the internet data. Emotional wellbeing and anxiety students may face a challenge of emotional that offsite learning that may bring and psychological anxiety which may lead to students to start losing the school connectedness

Calhoun (2020) studied the impact of covid -19 on medical students' surgical education implementing extreme pandemic response measures in distributed surgical clerkship experience in America. The study adopted a literature review. The findings revealed that covid -19 acquired students to acquire practical skills. Caoa *et al.* (2020) studied the psychological impact of the Covid -19 on the college students in China. The researchers adopted a quantitative research design. Data was collected from primary sources using a questionnaire from 7143 students. Data was analysed using SPSS. A univariate analysis was used to explore the significant associations between the sample characteristics and the anxiety level during the covid – 19 pandemic. Spearman's rank correlation coefficient was used to evaluate the association between the variables. The findings revealed that living with parents had a significant effect on anxiety. The results further indicated that living in urban areas was a protective factor against the anxiety as compared to rural areas. Stability of student's family income and living with parents were also protective factors against anxiety

Kapasiala *et al* (2020) carried out a study on the impact of lockdowns on learning status of undergraduate and postgraduate students during the covid -19 pandemics in India. An online survey was conducted using a structured questionnaire link from google form. The study population included 232 students. Findings revealed that students faced various challenges, students from the remote areas and marginalised faced more challenges Daroedono *et al.* (2020) analysed the impact of COVID – 19 on medical education based on the students' perception and practice of long distance learning in Indonesia. The study used a cross sectional study design. Primary data was collected using electronic questionnaires and in-depth interviews. The study population included 545 students from medical schools. The findings revealed that covid 19 has affected students in different ways.

Zhang et al. (2015) made a survey on the education inequality between the rural and the urban areas analysing the potential bottleneck for human capital accumulation in China. The survey was made to a population of 18000 households and a random sampling technique was adopted. The study was carried out in both rural and urban areas of China. The findings revealed that family characteristics,

there is a significant difference between family characteristics, school quality and students' performance. The major contributors to the rural urban education disparity included the demographic features, physical health measures, parental education levels and household education spending. Zhao (2016) made a survey on the deficient to strength shifting the mind set about education inequality in America through the review of literature. The study found out that the disparity was based on colour. Hanushek E.A. (2013) carried out a study on economic growth in developing countries analysing the role of human capital. The study adopted a quantitative research approach. Secondary data was collected from 21 countries across the globe. Descriptive and inferential statistics were used to analyse the data. The findings revealed that cognitive skills play a critical role in ensuring economic development of developing countries.

Various researchers have tried to analyse the challenges of moving to online learning in higher learning institutions across the globe. Their contribution to the literature on covid and the learning process of students can neither be ignored nor taken to be conclusive in explaining the impact of covid -19 on the learning process of students in Rwanda due to the following reasons. Firstly, previous researches have been carried out in an environment that differs from that of Rwanda (Daroedono *et al.*, 2020; Kapasiaa *et al.*, 2020; Caoa *et al.*, 2020, Calhoun, 2020; Drane *et al.*, 2020; Owusu *et al.*, 2020 and others mentioned above). Therefore, their findings cannot be concluded in the Rwandan situation. This study contributed to the existing literature by establishing the impact of covid – 19 pandemic on the learning process of students in Rwanda.

Secondly, previous literature provides little evidence on the inequality created by covid -19 pandemic on the students based on their area of location. It is important to mention covid -19 has created a learning inequality between students in rural areas and those in towns. Previous studies have mentioned the challenge of internet connections, electricity and lack of infrastructure that supports online learning (Drane *et al.*, 2020; Owusu *et al.*, 2020 and others mentioned above). However, their findings do not show which of the countries have been affected more with these challenges. Learning inequality arises when one area of the country group of the population can have access to education and others cannot (Caoa *et al.*, 2020). This study contributed to the existing literature by establishing the impact of covid 19 pandemic based on the location of students.

### **3.0 Methodology**

This study analysed how covid – 19 pandemic affected the learning process of students in the higher learning institutions in Rwanda. The following methods and techniques were used to collect and analyse the data.

#### **3.1 Research approach and design**

This research was guided by the pragmatism research philosophy as indicated by our thrust to understand how covid – 19 pandemic has affected the learning processes of students in the higher learning institutions in Rwanda. In this study, the researchers adopted a quantitative research design. Quantitative research design has been adopted in studies analysing the impact of covid -19 pandemic on the education (Daroedono *et al.*, 2020, Kapasiaa *et al.*, 2020 and Caoa *et al.*, 2020) This helped the researchers to establish the impact of covid – 19 pandemic on the learning process of students in the higher learning institutions. Twesige *et al.* (2020) points out that if study requires the use of questionnaires, the quantitative research design is the best that suits such studies.

#### **3.2 Study population and Sampling**

The study population was drawn from the higher learning institutions in Rwanda. According to the Higher Education Council (2020), there are 30 higher learning institutions in Rwanda. These include 2 public institutions and 28 private institutions. The target population of this study included students from different programs offered by the higher learning institutions in different campuses. 30 students were selected purposely from 29 higher learning institutions. University of Rwanda being the largest University with 9 campuses and six colleges, each campus was considered as an independent university from which 30 students were selected. Therefore, the total campuses from which the population was drawn were 38. The target sample was therefore 1170 students from all the higher learning institutions in Rwanda. A purposive sampling technique was used in order to select the students from three clusters which were Kigali city, towns and rural areas

#### **3.3 Data collection**

Data was collected from both primary and secondary sources using questionnaires and documentary evidence. A closed ended questionnaire was designed using a Likert scale and was emailed to students through their head department and class representatives. The researchers decided to use



mainly the questionnaire in the study because of the advantages it has over other instruments as cited by Kasomo (2006), Grafton, *et al.* (2011) and Twesige *et al.* 2020). With restricted movement to deliver the instrument and social distancing measure, online delivery can be more useful as compared to other tools. A pilot study was conducted with students from the department of accounting to ensure the reliability of the instruments. The reliability was tested using a Cronbach alpha test. The test indicated an alpha of 87% which indicated the instruments were reliable and could be used to answer the study objectives.

### **3.4 Data analysis**

After receiving the completed questionnaires from the field, a template was designed in the Statistical Package for Social Scientists (SPSS) which was used for data entry. After data entry and cleaning up, descriptive and inferential statistical tools were used to analyse the data. Descriptive data analysis was conducted using frequency tables, mean and standard deviation. On the other hand, the inferential data analysis was conducted using ANOVA and the Kruskal Wallis Test. The ANOVA was done to test the significance of the impact of covid -19 pandemic on the learning process of students in the higher learning institutions in Rwanda. Kruskal Wallis test was used to determine the areas that were most affected by the covid – 19 pandemic and to test the significance of the challenges of covid 19-pandemic on the students online process.

## 4.0 Results and Discussion

This section presents and discusses the results from the survey.

**Table 1: Mode of Learning during the Covid – 19 Pandemics**

<b>Tools used in online learning</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
Moodle online platform				22.0%	78.0%
Video conferencing	57.0%	15.2%	9.6%	8% %	10.3%
Moodle and Video conferencing	46.6%	22.7%	11.5%	18.2%	1.0%
What's-up groups			30.0%	65.0%	5.0%
What' sup and Moodle			35.6%	50.4%	14.0%

Source: Survey Data 2020

The results in table 1 show the mode of learning used by the higher learning institutions in Rwanda. Findings show that 100% agreed that they studied using an online Moodle platform, 72.2% of the students disagreed on the use of video conferencing in the learning process whereas 18.3% agreed that they used video conferencing during the study and 9.6% of the students were neutral. Furthermore, on the use of combination of Moodle and video conferencing to support the learning process, 69.3% of the students disagreed, 11.5% were neutral whereas 19.2% agreed that they used both Moodle platform and video conferencing during their learning process. The results further revealed 70% of students indicated the use of what's-up to support their learning process whereas

30% of the respondents were neutral. More still, the findings indicated 64.4% of the students agreed on the use of both Moodle and what's up to support their learning process.

The findings revealed that during the Covid -19 Pandemic, learning was shifted from the normal face to face classrooms to online classrooms using different learning platforms. This concurs with findings from previous studies. The study by Zhanga *et al.* (2020), Wargadinata *et al.* (2020) and Daniel (2020) show that covid – 19 led to a shift in the learning process from face to face to virtual classrooms. The findings further revealed that Moodle e-learning platform was the most used learning platform used by students during the learning process followed by what's-up. The findings revealed limited use of video conferencing in the support of the learning process by students. Use of whatsapp has been very fundamental in sporting group discussion and interactive learning by students. Owusu *et al.* (2020) has also found the use of what's up in Ghana to support online learning through interactive learning and group discussion.

**Table 2: Attendance of students**

		Frequency	Percent	Cumulative Percent
Valid	Every day	309	28.1	28.1
	Once a week	348	31.6	59.7
	Twice a week	96	8.7	68.4
	Three times a week	25	2.3	70.6
	never attended	322	29.4	100.0
	Total	1100	100.0	

Source: Survey Data 2020

Table 2 shows how students were attending the online classes. Findings show that 28.1% of the students attended their online classes every day, 31.6% attended once a week, 8.7% attended twice a week, 2.3% attended three times a week whereas 29.4% never attended their online classes. The

findings therefore revealed that covid – 19 have affected the students’ attendance of classes as only 28.1% of the surveyed students managed to attend their classes on a daily basis. The findings concur with findings from previous studies. The study conducted by Daroedono *et al.* (2020), Caoa *et al.* (2020) and Kapasiaa *et al.* (2020) shows poor attendance of students on online learning. This does not only to low skills attained by the students, but it also leads to learning inequality within the students.

**Table 3: Gadgets used by students during the online Process**

		Frequency	Percent	Cumulative Percent
Valid	Smart phone	646	58.7	58.7
	Laptops	263	23.9	82.6
	Laptop and Smartphones	149	13.5	96.1
	IPad	39	3.5	99.7
	Internet Cafe	3	.3	100.0
	Total	1100	100.0	

Source: Survey Data 2020

In table 3, the respondents were asked the tools they are using during the online learning. Findings show that 58.7% they use smartphones, 23.9% they have laptops, 13.5% have both laptops and smartphones, 3.5% have iPads whereas 0.3% of the students go to internet café in order to access online learning. Findings revealed that majority of the students only access the learning platform through the use of smartphones. Although this may look to be good news that majority of students can at least access the learning platform through the use of their platform, However, the challenge with the use of smartphone is that it is complicated for students to attempt assignments especially assignments that are quantitative. This further affects the quality of learning process of students. Huston et al (2020) asserts that lack of gadgets impinges on the student’s learning process.

**Table 4: Challenges students face during Online Learning**

			Location		
			Rural Areas	Towns	City of Kigali
<b>Challenges faced during the online learning</b>	<b>Lack of computers</b>				
		% within Location	75.6%	18.0%	6.4%
	<b>Lack of enough skills to learn online</b>				
		% within Location	75.0%	65.0%	70.0%
	<b>Lack of electricity</b>				
		% within Location	60.0%	25.0%	15.0%
	<b>Home environment was not conducive</b>				
		% within Location	65.0%	70.2%	65.8.0%
	<b>lack of internet data</b>				
		% within Location	50.9%	36.8%	12.3%
	<b>poor internet connections</b>				
		% within Location	79.6%	41.1%	39.3%
	<b>Studying without doing exams</b>				
		% within Location	78.0%	62.0%	80.0%
	<b>Learning infrastructure are not sufficient</b>				
		% within Location	82.9%	69.4%	57.6%

Source: Survey Data

One of the key measures to combat the spread of covid – 19 was the closure of schools. After the closure of schools, teaching and learning was shifted from the normal classrooms to virtual classrooms using different technological tools. Table 4 shows the challenges that students face while studying online learning. Findings show that students faced numerous challenges while studying online. Findings revealed that 75.6% of students in rural areas have no access to the computers as compared to 18% and 6.4% of students in towns and Kigali city respectively. Furthermore, findings also revealed that students lacked enough skills to study online as reflected by 75%, 65% and 70% of students from rural areas, towns and cities of Kigali respectively. Results further showed that 60% of the students had a challenge of electricity in rural areas as compared to 25% and 15% of the students in towns and Kigali respectively. On the conduciveness of the home environment, results show 65% of the students from rural areas indicated that home environment was not conducive as compared to 65% and 70% of the students in towns and city of Kigali respectively. The results further showed that 50.9% of the students lacked internet data to follow the online learning as compared to 36.8 in towns and 12.3% in the city of Kigali. Another challenge that students faced while studying online is the poor internet connections. Findings show that 79.6% of the students in the rural areas are affected by poor internet connections as compared to 41.1% and 39.3% of students in towns and cities of Kigali. Both Summative and formative examinations are tools used to assess the learning status of students. In order to combat the spread of covid -19, social distancing measures were introduced. This led to the closure of schools and thus limiting students from being unable to sit for their exams. 78% of the students from the rural areas were concerned with studying without doing exams as compared with 62% from towns and 80% from the city of Kigali. Results further showed that the learning infrastructures were not sufficient to support effective learning by the students. This is evidenced by 82.2%, 69.4% and 57.6% of the students from the rural area, towns and city of Kigali respectively.

The findings revealed various challenges that affect students while studying online. These included lack of computers, lack of enough skills to study online, poor internet connections, lack of internet data, lack of learning from peers through group discussions, lack of face to face clarification, insufficient learning infrastructures like virtual laboratories and poor home learning environment. The findings conformed to the findings from the previous studies. The study conducted by Kapasiaa *et al* (2020) found that students face various challenges while studying online. Similar finding are seen in the studies conducted by (Drane *et al.*, 2020, Owusu *et al.*, 2020 and Abidah *et al.*, 2020)

<b>Table 5: Ranks of the most affected students</b>			
	Location	N	Mean Rank
Challenges faced during the online learning	Rural Areas	135	189.44
	Towns	94	158.03
	City of Kigali	81	131.38
	Total	310	

Source: Survey Data 2020

Results in the table 5 show the most affected area during the online learning using the mean rank. The results show that students in rural areas face more challenges with online learning as compared to students in towns and cities of Kigali. This was due to poor internet connections, lack of internet data and unstable electricity. The findings concur with the findings from the previous studies. The study conducted by Caoa *et al.* (2020) shows that students in rural areas are more marginalised with the online learning as compared to students in towns and cities. Similar findings are seen in the study conducted by (Daroedono *et al.*, 2020). It is clear that covid has led to learning inequality among students where students in rural areas are the more affected. This conforms to the findings in the study conducted by (Doyle, 2020).

**Table 6: Test Statistics<sup>a,b</sup>**

	Challenges faced during the online learning
Chi-Square	21.049
df	2
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: Location

Source Survey Data 2020

Table 6 shows the Kruskal Will's test of the significance of the challenges faced by students during the online learning in the period of covid – 19 pandemics. The results from the survey show lack of computers, lack of enough skills to study online, lack of internet data, poor internet connections, home learning environment, electricity, and change of academic calendar are statistically significant the effective learning process of the students based on the location of the students.

**Table 7: Significance test of the Impact of covid -19 on the students Learning Process using ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
Reduction in the maintenance costs	Between Groups	66.726	2	33.363	27.740	.000
	Within Groups	369.223	1097	1.203		
	Total	435.948	1099			
affected the quality of learning	Between Groups	6.500	2	3.250	3.591	.029
	Within Groups	277.836	1097	.905		
	Total	284.335	1099			



**Table 6: Test Statistics<sup>a,b</sup>**

	Challenges faced during the online learning
Chi-Square	21.049
df	2
Asymp. Sig.	.000

a. Kruskal Wallis Test

lack of face to face clarification	Between Groups	22.301	2	11.150	9.310	.000
	Within Groups	367.686	1097	1.198		
	Total	389.987	1099			
Studying without examination	Between Groups	3.700	2	1.850	1.292	.276
	Within Groups	439.771	1097	1.432		
	Total	443.471	1099			
Promoted independent learning	Between Groups	18.185	2	9.092	6.437	.002
	Within Groups	433.635	1097	1.412		
	Total	451.819	1099			
Lack of group discussion	Between Groups	4.257	2	2.128	1.973	.141
	Within Groups	331.192	1097	1.079		
	Total	335.448	1099			

**Table 6: Test Statistics<sup>a,b</sup>**

	Challenges faced during the online learning
Chi-Square	21.049
df	2
Asymp. Sig.	.000

a. Kruskal Wallis Test

Unable to do research	Between Groups	5.181	2	9.012	8.891	.003
		379.224	1077			
	Within Groups			1.723		
	Total	384.405	1099			
Unable to do Internship	Between Groups	6.349	2	12.010	11.992	.000
		831.920	1097	1.123		
	Within Groups					
	Total	838.269	1099			
Covid -19affected the academic calendar	Between Groups	39.667	2	19.833	22.496	.000
	Within Groups	270.669	307	.882		
	Total	310.335	309			

Source: Survey Data 2020

Table7 shows the impact of covid -19 on the learning process of students. The results show that covid -19 has had numerous impacts on the students’ learning process. Findings show that covid -19 have had a significant impact on the maintenance costs for the students, face to face clarification, quality of learning, independent learning, students’ internship, students’ research and the academic calendar as evidenced by P-values of less than 5%. The results concur with findings from the previous studies. The study conducted by Zhanga et al. (2020) and Daniel (2020) show that has led

to a shift from the face to face to online learning which has affected the students' learning process. Furthermore, the study by Daroedono *et al.*(2020); Kapasiaa *et al.*(2020); Caoa *et al.* (2020), Calhoun (2020); Drane *et al.*(2020); Owusu *et al.* (2020), show that covid-19 led to a change in the academic calendar for the students more especially students in the final year. The study by Naciri (2020), Chan (2020) and Abidah *et al.* (2020) show that covid -19 pandemic has affected the quality of learning more especially to students doing science courses due to lack of virtual laboratories, library, cardeva. In addition, the findings from the survey show that covid -19 has had impacts on the group discussion and examinations. The findings contradict with the results from the previous studies. Studies by Drane *et al.* (2020) Owusu *et al.* (2020) Karalis, (2020) Brown *et al.*, (2020) show that learning from peers through group discussion is very fundamental in the learning process of students. More still, both formative and summative assessments are very critical in the learning process of the student.

## **5.0 Conclusion and Recommendations**

### **5.1 Conclusion**

The study analysed the impact of covid – 19 pandemic on the learning process of students in the higher learning institutions in Rwanda. The findings revealed the covid -19 pandemic has had numerous impacts on the students learning process in Rwanda. The impacts of covid – 19 pandemic on the learning process of students in the higher learning process are both positive and negative but the negatives outweigh the positive impacts. The negative impacts of covid – 19 pandemic include learning inequality among students, poor attendance of classes, lack practical skills for courses that require the use of laboratories which affected the quality of learning skills acquired by students, lack peer learning due to limitation of group work due social distancing measures. The positive impact of covid -19 on the learning process of students in the higher learning institutions included promotion of independent learning by the students; maintenance cost of students during the learning process and improved the technological skills of the students. Furthermore, the findings revealed students in rural areas were affected more with the challenges of internet connections, internet data and electricity as compared to students in towns and city of Kigali.

## **5.2 Recommendations**

Closing the learning inequality gap that has been created among the students in towns, cities of Kigali and those from the rural areas due to poor internet connections in the rural areas. Also a need to close the inequality gap between students who have access to the learning gadgets and those who cannot be able to access such gadgets.

Education institutions should train the students on online learning. A module should be introduced in the first year that introduces to students the online learning. More to that online learning should be part and partial of the education institutions. Part of their modules should be delivered online and other parts face to face.

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