TRANSITION TO ONLINE LEARNING IN HIGHER EDUCATIONAL INSTITUTIONS DURING THE COVID-19 PANDEMIC PERIOD IN MADAGASCAR

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ABSTRACT

This paper takes stock of the necessary transition to e-learning due to the upheaval of teaching-learning because of the COVID-19 pandemic. It focuses on higher education and exploits the results of an online questionnaire answered by 52 teachers-researchers from three public higher education institutions and one private university. The questionnaire asks about the use, technological and pedagogical adaptation made during the pandemic as well as the impact of this adaptation in their personal development and in the pedagogical continuity. The majority of respondents are those who already have the technological means, computers, internet connection and minimal computer skills, but the needs and challenges declared highlight the importance of teacher training, accompaniment, i.e. administrative and technological support to ensure the quality of teaching, an essential condition for a successful transition. The example of the means implemented by a private university that has particularly invested to avoid any pedagogical break is described and illustrates this positive effect of institutional support.

Keywords: only learning, universities, benefits, limits,

1. Introduction

As in many countries, the year 2020 in Madagascar was marked by the prolonged closing of schools and universities, because of the COVID-19 crisis. The Malagasy government response to the COVID-19 pandemic in general and in the education sector, specifically fundamental education, has been described (Raholdina Razafimbelo & Razafimbelo, 2021) giving priority to exam classes[1], looking forward to the execution of official exams (Baccalaureats, BEPC, CEPE). Measures were implemented, namely radio broadcasts for all levels, distribution of self-study booklets and the use of digital and internet resources for learning purposes, as well as other related measures such as the preservation

[1] The education and training sector is composed by three departments The Ministry of higher education and scientific research (Ministère de l'Enseignement Supérieur et de la Recherche Scientifique,MESupReS), the Ministry of national education (Ministère de l'Education Nationale, MEN) and the Ministry of technic education and professional training, (Ministère de l'Enseignement Technique et de la Formation Professionnelle, METFP)

The MEN consists of primary education, attested by the Certificate of primary and elementary studies (Certificat d'Etude Primaire et Elémentaire , CEPE) and secondary education during seven years that is constituted by two cycles. The first secondary cycle takes place in the college during four years and is attested by an undergraduate study certificate, the Brevet d'Etude du Premier Cycle (BEPC), The second cycle of the secondary education is located in high school (lycée) during three years. It is sanctioned by the Baccalaureate diploma. The grades at the end of each cycle are named "exam classes.".

of the financial situation of the teachers, the parental support in order to reduce instances of school dropout and funding prospects for the education sector.

However, in high level education, the implementation of efficient measures has proved to be more difficult, resulting in a blank year (2019-2020) in public high level education settings. One of the main measures taken to ensure pedagogical continuity in high level settings was the transition to remote learning, with courses delivered online or via video conference platforms. A study over around sixty malagasy students about the changes brought by the implementation of distant learning under COVID-19 (Andriariniaina, Ratompomalala & Sawamura, 2021) has highlighted the existence of differences between students.

The question is therefore about the sources of the issues faced when deploying remote training in the Malagasy high level education. In a survey led by Brajcovic *et al*. (2020), the authors identified several issues related to the implementation of pedagogic continuity in high level education during the COVID-19 pandemic. The main issues identified were linked to adaptation of teachers to new teaching modes online, the availability and access to information and communication technology, and the communication issues between teachers and learners.

Another survey led by Hodges *et al.* (2020) also reveals that these issues are related to access and use of information and communication technology.

To bring some answers to the initial question, we focused on two main axes : access and use of technology, on one hand, and adaptation of teachers to online teaching, on the other hand.

Surveys were carried out with teachers in 2021, to better understand the adaptation context they could benefit from to enable online teaching.

The objective of this paper is therefore to analyze the online teaching practices observed in order to propose ideas of recommendations to enhance the efficiency of online training.

As it was specified above, the pandemic has overturned high level education in Madagascar, as it required schools to adopt distance teaching methods to maintain pedagogic continuity. This unanticipated transition to « all digital » was not without consequences on the quality and results of teaching though.

If we look closer at the best practices in terms of pedagogical continuity experience in university settings, there were multiple challenges which were faced in different ways. Hodges *et al.* (2020) have highlighted the importance of planning, training the teachers and providing technical assistance to enable a successful transition to online learning.

In the survey led by Parikh *et al.* (2020) on the impact of the COVID-19 pandemic on behaviors and practices of university teachers in India in terms of online teaching, it is found that lack of training is one of the obstacles to transition to online learning, in addition to lack of resources and technical support.

As for Gao *et al.* (2020), they examined the effects of the transition to online learning and showed that the quality of online teaching and technical support provided to students impacted significantly the learning results.

In a different context, Means *et al.* (2020) also carried out a survey on the impact of the transition to online learning on the US students' learning results during the COVID-19 pandemic. Their works have

shown that students have seen a decrease in the quality of the education they were provided and an increase in the workload, while learning results have not been significantly changed.

Indeed, the different experiments highlight the importance of planning, training the teachers, technical support and quality of online teaching to enable a successful transition to online learning in high level education during the COVID-19 pandemic.

2. Methodology

Data collection was carried out through a questionnaire addressed to teachers from public and private universities. It was designed in the context of a common research of a research group from Africa Asia Dialogue (AAD)[2], during which a pilot study was jointly decided in July 2021, as well as a main study in January 2023.

We have received 45 responses in 2021, and 7 in 2023, bringing the total number of responses to 52

The questionnaire inclues seven (07) parts :

- academic informations about the surveyed researcher teacher, his personal habits for using digital tools;
- the technological use and adaptation done during the COVID-19 pandemic;
- the impact of COVID-19 on teaching-learning, per the understanding of the researcher teacher;
- the relations between COVID-19 and the professional development of the university teacher;
- the knowledge of techno-pedagogical content by the researcher teacher;
- the challenges due to the technologies adaptation during the pandemic;
- the comments and suggestions from university teacher.

Data was collected online using Google Forms, which made its transfer easier on Excel. As the responses were all related to the same period - the lockdown during the COVID-19 pandemic - we grouped all responses in the same file before proceeding to cleaning and coding the answers to open questions, then started the processing.

An interview was also possible with the pedagogical manager of one private university, to better understand the transition carried out toward online learning in the period of the pandemic. After collecting general information on the surveyed setting and the quality of the surveyed manager, we ran an analysis of the use and adaptation of pedagogical content during the pandemic. We asked the manager how learning was adapts, which adaptations were made on the technological, pedagogical, academic content for university teachers, which support was provided by the university to the teachers and the challenges related to this transition. Responses were transcribted and the verbatim analyzed.

3. Results

We will present separately the results of the questionnaires sent to teachers and those of the interview with the setting manager.

[2] This is a common research intitled “Enhancing the Digital Pedagogy Skills of Academics in African-Asian Countries: A Strategy to mitigate COVID-19 Pandemic and beyond », conducted by six universities members of the AAD from Uganda, Ethiopia, Ghana, Vietnam, Madagascar, Nigeria

3.1. Teachers and the COVID-19

We will analyze in this section the teachers' responses to the questionnaire sent to them. These responses were shared with us 2 to 15 days after the questionnaire was made available online.

3.1.1. Characteristics of the respondents

The respondents consist of 52 researcher teachers in total (45 in 2021 and 7 respondents in 2023), of which 52% are female and 48% male.

42% are teachers trainers (ENS), 44% work in technology training, and 2 teachers (4%) come from government-authorized private universities.

Among these teachers, 23% are contractors.

Regarding their qualification, 52% own a Master 2 diploma, DEA or DESS, 37% have a PhD or Doctorate, and 10 % have a HDR or State doctorate; three (03) are professor emeritus.

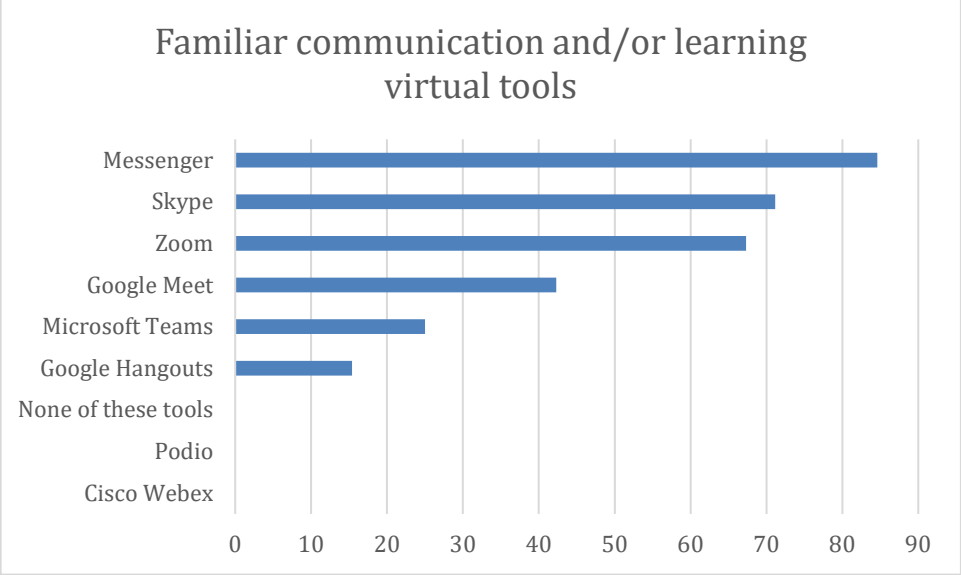
3.1.2. Teachers access to digital

Almost all responding teachers own a laptop (98%). The only teacher without one had a desktop computer instead, but his cell phone was on Android ; more than half (52%) own both a laptop and a desktop computer. Therefore, responding teachers are relatively well-equipped with-IT materials, and it is possible for the majority of them (79%) to connect to their phones and share a Wi-Fi hotspot onto their computer or the other way around. 79% confirmed they can connect to the internet at home using mostly mobile recharges as means of connection (40%), or available shared Wi-Fi (37%). Only a fifth of the teachers (19%) have high speed optical fiber available. About a fifth of respondents (21%) usually use more than 2 means of connection, of which mobile recharge. This means the majority of responding university teachers do not claim facing connection issues.

3.1.3. Teachers use of technology

Surveyed university teachers are already aware of several tools to create online content, among which YouTube (54%), Microsoft Suite (52%) and Google Suite (42%) are the most familiar; Camtasia and Gomo are completely unknown to them, Canvas and Spring Suite are familiar to only 10% of them.

Regarding communication tools, those familiar to them are presented in the below chart :



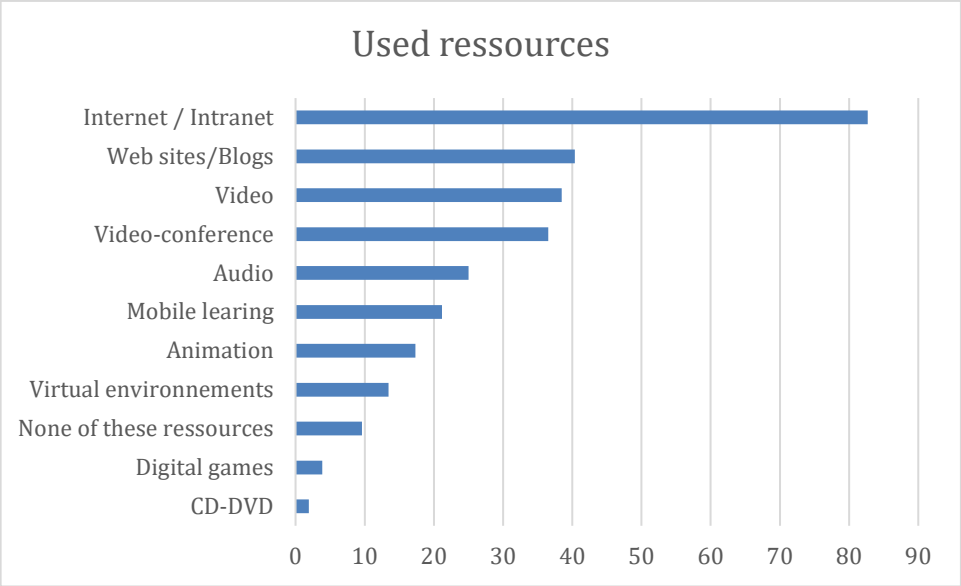
Therefore, responding university teachers are already used to communicating on social networks (Messenger, 85%), Skype (71%), Zoom (67%) and Google Meet (42%).

During covid 19, the majority of teachers declared they connected at least during one half day every business day. Indeed, a little less than half of the teachers (48%) said they were connected more than 20 hours per week, which is more than one half day, and 37% are connected between 10 and 20 hours per week, which is about one half day per business day. Around a quarter (24%) were connected during less than two hours per business day.

If we consider that the average face-to-face working time is 20 hours per week[3], around half of the teachers have respected this work duration in connected mode during the lockdown.

Communication with the students was done through « chat » during the pandemic. A third of the teachers (29%) said they only chat occasionally for professional reasons; others discuss online with their students everyday (38%) or several times per week (33%).

Devices used during the interactions with students are laptop computers (67%), USB keys (31%), video projectors (27%), smartphones (19%). Materials and resources are presented below.



Learning materials and resources have become more modern for teachers. The internet is the learning vehicle used. However, it is worth noting that teaching has become asynchronous, because videoconference is only familiar for about a third of teachers and mobile phones are only used by a fifth. The contents which could be uploaded to websites and blogs in the form of video or audio files were one of the common resources. Contents are no longer stored as CD or DVD (4% only).

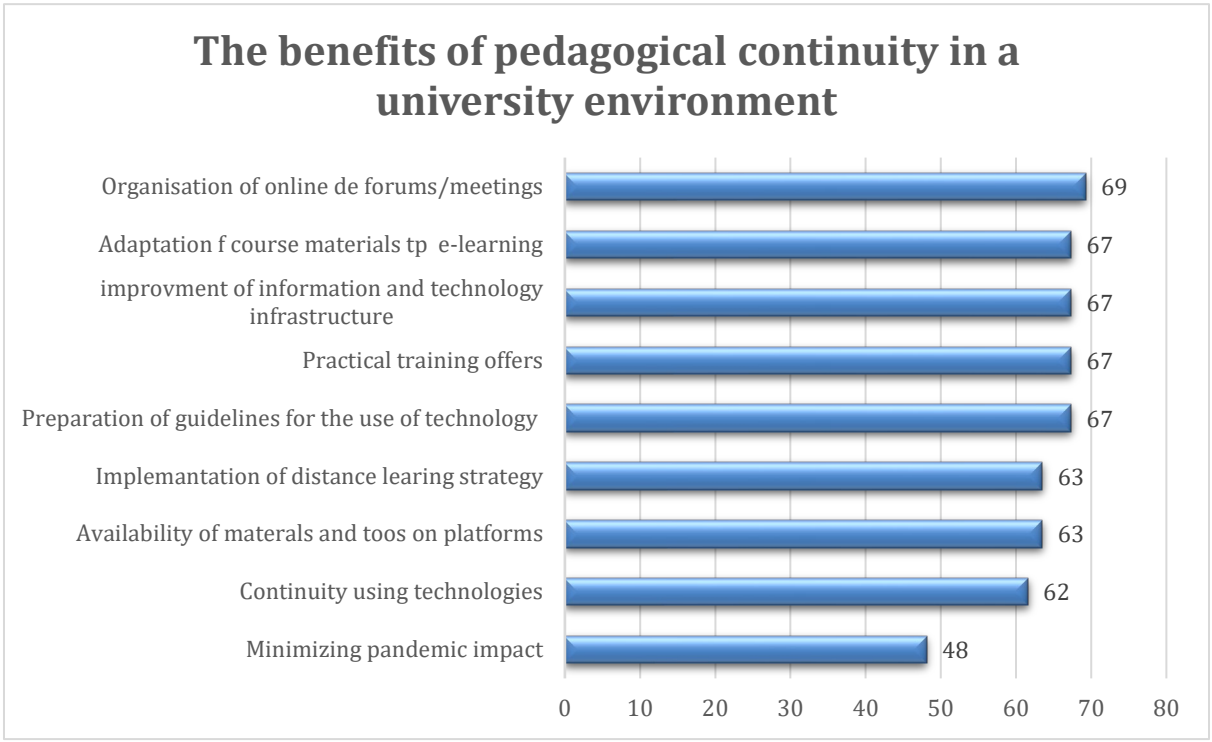
Regarding learning management (storage space for documents, homework, information and reminders to the students), half (50%) said they used Moodle. Google Classroom (12%), Blackboard (8%) and Canvas (6%) ; Open Edx (2%) has also been mentioned, but a quarter of teachers (23%) said they used another system without specifying which one.

[3] Average value calculated from the implementation of the recommended credit system (from ministerial ruling N° 04.152/2010-MESupReS on the organization of university studies leading to the diploma and degree of License, 14 mars 2010, 11th article.

Anyhow, half of the teachers (52%) are confident in technology-based learning, the rest are rather undecided (19%) or little confident (17%).

3.1.4. Contribution of continuity in the university environment

Pedagogical continuity has had positive impact on organization of university work, if we refer to the percentages of contribution mentioned and presented in the below figure



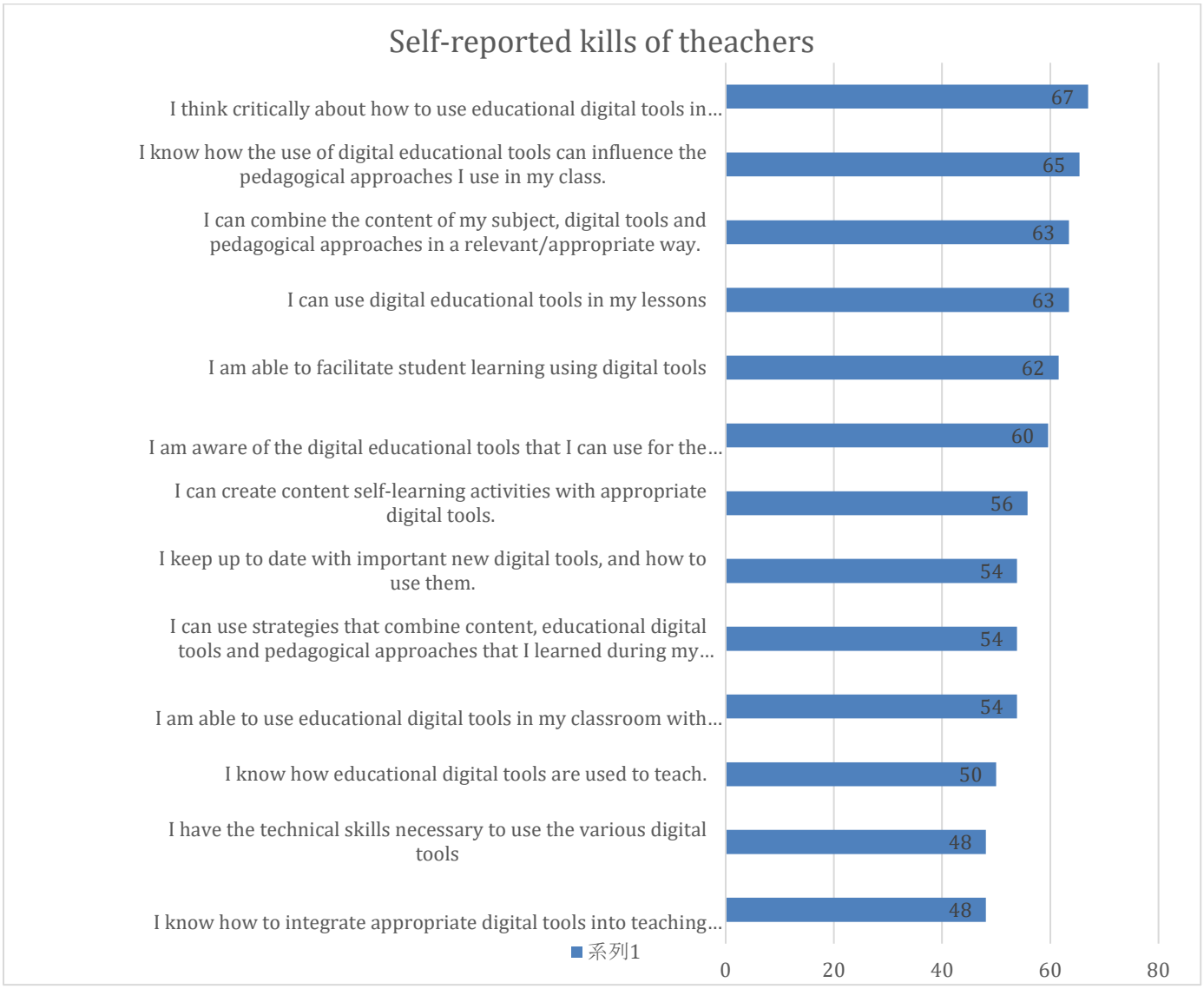
The pandemic brought changes that the teachers in the university world appreciated; it is no longer mandatory to be physically present to attend a meeting or a conference, (69%) which excludes possible issues related to transport and travels. Courses were adapted and gained in practicality (67%).

Other contributions consist of support to some settings in terms of adapted infrastructure (67%), instructions and preparation of remote teaching (67%), availability of resources on the platform (63%).

Following the adaptation performed during the COVID-19 period, teachers said they have the following skills.

2.1.5. Challenges due to the technological adaptation during the pandemic

Only a third of the teachers (31%) say they have been little prepared to teach their subject using ICT; little less than half say their qualifications prepared them for it (46%) or prepared them well (21%) during prior training.



Around a fifth of the teachers (22%) benefitted from continuous training in the form of various workshops lasting several days to one week, whereas the third say the university has prepared such a system. These trainings contributed to their professional development according to 26% of them.

The technological adaptation made necessary by the exceptional situation of the pandemic, enabled highlighting three main challenges :

- insufficient budget provisions (65%) ;
- lack of administrative support (48%) ;
- inaccessibility of ICT (44%).

The majority of teachers say that:

- they do not know how to resolve their own technical issues related to the ICT made available by their school (65%);
- they do not have any experience in using appropriate educational software for the various learning contents of the subject they are teaching (50%).

The following training needs were mentioned:

Responding teachers have said several obstacles to use of digital or remote teaching frequently mentioned can be overcome, namely :

- lack of time (65%), whether it is preparation time or course and learning time;
- negative behavior of students towards learning with ICT (62%);
- reluctance of teachers to use ICT (54%). This could simply come from lack of skills or knowledge to integrate them in their pedagogy.

3.2. An example of “successful” transition

The manager we have contacted is the general coordinator of studies and is responsible for studies in her university. She has a Master degree, is aged about thirty years old and has held this position for more than 7 years, when the teachers who work in the school are eminent professors, nearing their sixties, and for most of them permanent employees of a public university.

3.2.1. Adaptations carried out in the setting during the COVID-19 lockdown

During the COVID-19 pandemic, high level settings were mandated by the government to close, the private university considered themselves trapped, as well from a financial as from a pedagogical perspective. Teachers working there are paid hourly, which is different from teachers who are public officials in public schools; the students also paid monthly school fees, which implies teaching-learning activities during the month. The closure of the school would be an unprecedented socio-economic disaster for the actors.

It was therefore decided to invest financially as well as pedagogically to make pedagogical continuity possible in spite of the lockdown. A few adaptations were then performed.

a) At the infrastructure and equipment levels

Majority of classrooms in the surveyed private university are equipped with fixed video projectors, mobile video projectors were available for the others. They also own 4 specialized classrooms : language lab with 20 seats, equipped with microphones and headphones, computer lab equipped with 40 computers, electronic lab with two computers and troubleshooting material, and a documentation and information center with 6 computers. There was no experimental science lab (natural sciences and physics and chemistry) in the setting. Three large rooms are equipped with microphones and projection screens.

During the pandemic, the setting purchased both an internet connection through optical fiber, and access points for mobile wifi. Two meeting rooms for video conference with camera, projection screen, microphones following international standards were set up, and each of them had a performant camera.

Android phones were also purchased to enable teachers to quickly transition onto phones in cas of power cuts, because "offloading" was frequent during that period.

b) At the pedagogical level

Courses were live broadcasted on Facebook, which was the cheapest mean to connect for students. The teacher delivers the training "live"; they appear live, on video, on the Facebook group of their class, but do not see their students. This interaction mode was preferred to Messenger, for which video calls were only allowed for a limited group and connection was more expensive.

Teachers have then discovered that a 2 hours face-to-face course easily ended up as 45 minutes in video format. Gradually, they started to use PowerPoint, innovate their approach, present with animation, etc. in short, to modify their preparation to teach differently.

While the teacher delivers the course, pedagogical managers check the presence of students and note possible connection delays.

The evaluation was left up to the teachers: those who considered it useful could grade students ‘products, whereas those who considered they needed to assess their students "on-desk" waited until the end of the lockdown to do it, after a short period dedicated to on-site revisions.

3.2.2. Identified contributions

The interviewed manager mentions several contributions of the transition to digital :

- developing new skills allowed teachers and students to face the pandemic more serenely;
- the years following this first experience have seen registrations increase notably : the success of remote teaching initiated by the setting demonstrated that teaching in this school could continue and will not be disturbed by possible pandemics or natural catastrophes, or strikes.

Currently, the Master's degree is delivered in hybrid mode, mandatory daily physical presence of students does not exceed one half day.

After one to two months to take charge, most teachers have been able to choose between delivering their courses during normal hours while staying home, or coming to the school to benefit from IT technician support. With equal work, the travel is reduced, which strengthens their motivation.

3.2.3. The challenges

Except for the financial investment necessary for the adaptation of infrastructure and equipment, the biggest challenge was convincing teachers - most of them were old and not familiar with digital - to pursue teaching during the pandemic. Many of them wanted to stop, and the managers had to use a thought-through strategy to raise awareness. A small group was formed with those who were most motivated to continue, and who would benefit from first trainings with the administrative and technical personnel. A trial remote teaching was conducted during one week, and other teachers gradually came and increased the batch afterwards.

Given some teachers' inability to manipulate digital within a short time (one week), the setting recruited multiple IT interns to handhold them : uploading of files, calls and online reception, screen sharing, design and development of videos, etc.

In parallel, students and their parents were made aware of the necessity to continue to work during the lockdown, using messages sent on social networks. They were encouraged to register quickly and pay their school fees, to access the training platform, and this was done in two weeks.

The admin staff and IT technicians designed and published tutorial videos to prevent technical issues for teachers and students.

Given the absence of audio interaction from students to the teacher, it occurred that the teacher finished their intervention earlier than planned ; but it did not influence their pay at normal rate, and this has overcome remaining resistance.

Some students had connection issues due to insufficient internet speed at their homes during the pandemic. They were asked to invest more in connection, because the remote teaching allowed saving on other costs (travel, food).

To conclude this example, it should nevertheless be pointed out that the success we are talking about is the success of the transition to another way of teaching and learning, but there has not been a comparative assessment of students who have followed face-to-face or online teaching and learning.

4. Discussion

Numerous authors have highlighted the importance of necessary skills to design and develop efficient online courses. Different studies highlight for example the importance of follow-up actions to help teachers adapt themselves to online teaching methods, to develop skills in designing online courses and managing virtual classrooms, to improve their online pedagogical practices and to efficiently integrate technology in their practices (Chou, 2017). During the emergency of the pandemic, some steps were inevitably skipped in the accompaniment of teachers, which did not favor better adaptation. However, a third of teachers said they were not prepared to online training and use of ICT. To support teachers in adapting themselves to online teaching methods, developing new skills for online courses design, improving their online pedagogical practices and efficiently integrating technology in their practices, follow-up measures could take different shapes. Some studies suggest follow-up measures would be efficient for teachers if they include continuous training, mentoring, modelling (Freeman et

al., 2014). The same goes for regular feedback to help teachers integrate active pedagogical methods, individual coaching sessions or group discussions on online teaching strategy (Littlejohn *et al.,* 2016), online forums to share best practices, practice community and platforms for online educational resources sharing (Durak et al., 2016). But in the context of emergency, are these measures always the most efficient ?

Regarding most used tools, Messenger, Facebook's instant messaging platform is the most used tool. The use of Messenger as online training tool is a relatively new research field, but it has drawn an increasing interest over the last years. Al-Fadhli *et al.* (2018) have shown that the use of Messenger increased the engagement of learners and improved their school results.

The use of Messenger as online training tool presented pros and cons depending on the circumstances. The results of the survey by Boticki and Baksa (2019) have shown that Messenger can make communication between teachers and learners easier, and encourage peer collaboration. Nonetheless, results of survey led by Malec (2018) have shown that, although the use of Facebook could provide some advantages in terms of communication and collaboration, it can cause distractions and disturbances, which can harm the focus and productivity of learners. Tao *et al.* (2021) go further and mention risks such as excessive dependence to mobile devices due to the use of applications such as Messenger, as well as the information overload and attention decrease for the learners. In the case of Madagascar, the free cost and the features of Messenger largely justify its use, but possible drawbacks related to its use need to be kept in mind.

The pedagogical continuity requires appropriate technological tools, technology skills and appropriate planning to ensure quality teaching (Karsenti, 2020). In our case, considering the high number of those who considered themselves as prepared (67% in total) and the proportion (65%) that say they still need techno-pedagogical support, it seems that the notion of preparation for the teachers may be linked to technical possibilities: having a computer, access to internet. A training, namely continuous, for teachers would allow refreshing their technical, pedagogical and didactic skills.

One of the obstacles to the rollout of hybrid or remote teaching is the insufficient digital skills of teachers, especially if most are already in a high age range. One solution practiced in the private university is to provide technical support for each teacher. This requires on one hand a large number of IT technicians (and hence a significant financial investment, even if they are interns) and, on the other hand, could lead to dependence. We mention for example the mental block of teachers in the surveyed private university, who were not able to complete online questionnaires, according to the surveyed manager. They did not ask for help from the IT technicians to complete the questionnaires, because they considered it as an extra-professional activity, and asking for help would be seen as acknowledging their lack of skills.

The success of online teaching requires a lot of courage, humility, and the literature states that loneliness and repeated failures could lead students to abandon and teachers to block. It would be necessary to instill a culture of sharing and exchanges, but also a culture of self-learning both for teachers and for students : how to do research on the internet in case of difficulty, how to find online tutorials and use them.

The transition requires financial and human investment (managers, teachers, students...). Nothing is impossible, as evidenced by the "successful model". However, results obtained confirm those mentioned in the survey carried out by Andrianirina, Ratompomalala et Sawamure (2021) on students, which shows that remote teaching can strengthen social inequalities: students in isolated areas during

the lockdown had difficulties to connect and lagged behind, whereas the schools and/or students with significant financial resources could invest in equipments, and this favored the success of the continuity. How could public universities manage their financial resources, or get support from the government, to be able to rival the private university in terms of financing?

5. Conclusion

The issues which emerged during the COVID-19 pandemic have seen the increase of online activities exploitation in various fields of everyone's daily lives, to name for example "remote working", which was at the beginning implemented to tackle severe economic consequences of stopping all activity because of the pandemic-related lockdown and became afterwards another form of « work ».

Teaching-learning was not left behind. In the opposite, each education level faced the necessity to resort to it, and everyone tried to implement a transition to online learning. Many researchers shared their results regarding the description, analysis, and understanding of different actions related to the use and adaptation of this learning mode.

This work focused on high level education exposed a situational analysis of the technological and pedagogical use, adaptation of several teachers-researchers in three public settings in Madagascar and one private setting. It has shown that, as far as high level education is concerned in particular, the training of teachers, follow-up and preservation of education quality are particularly important to enable a successful transition to online learning.

However, the results were obtained from the responses of 52 researcher teachers who completed the online questionnaire, which limits this work because this data collection method already implies that respondents have minimal technological resources and IT skills.

The example of measures taken by the private university, on one hand, and the challenges stated by the responding teachers in public settings, facing insufficient financial, administrative and technical resources, and insufficient technical and pedagogical support and follow-up through specialized training, on the other hand, seem to highlight the importance of a policy in favor of this development project of online learning and call for deciders' attention…

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