

Ability to provide remote educational support at HITS Jendouba following the VUT action plan during the COVID-19 pandemic

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Abstract

This article presents the Higher Institute of Technological Studies of Jendouba (HITSJ) before the COVID-19 pandemic and after the action plan followed to ensure the online educational support of students during the period of confinement. The objectives are to (1) emphasize the use of Distance Learning (DL) before the pandemic in the HITS of Jendouba using the statistics produced by the E-learning correspondent (ELC) of the establishment; (2) the action plan of the Virtual University of Tunis (VUT) during the confinement period, including the role of the online education department in the action plan, the role of the ELC in the plan of action, teacher training and the pedagogical scenario adopted; (3) newly acquired pedagogical and technical skills, teaching staff pedagogical skills and technical skills; (4) educational support during the confinement period, the deployment of study plans on the Moodle platform iset.uvt.tn, the adaptation of group timetables and the synchronization of videoconference sessions; (5) an empirical study of pedagogical support, measurement of the Commitment of the teaching staff, measurement of the registration of students on the platform and in the courses, measurement of the success rate of distance education in the transmission of knowledge and learning, measurement of feasibility according to the departments, measurement of the impact of teacher training in remote education.

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- ✓ HITSJ,
- ✓ teacher training
- ✓ scripting of online courses

1. Introduction

Higher education has been among the sectors most disrupted by the COVID-19 pandemic and lockdown. The closure of schools and universities was almost immediately adopted around the world. Many countries have gone through a period of total cessation of courses.

The second semester was severely disrupted and educational continuity was considered through ministerial decision-making to try to make a success of the 2019-2020 academic year.

The decisions were innovative and out of the ordinary and several questions regarding the feasibility and fairness of the solution were asked.

In addition to the current situation, concern and uncertainty relate to the conditions for the resumption of lessons in September 2020.

The COVID-19 crisis has accelerated the digital transformation in the practices of the Tunisian university on the administrative side and in particular on the educational level.

In this time of crisis, learning will need to evolve and will need to be delivered online, it is mandatory to upgrade teachers' skills and readiness to engage with digital platforms and reformulate learning models to leverage the best use of digital resources and tools. Under the sign of organizational change and the change in teaching methods, accelerated

learning for teachers is envisaged, support procedures for teachers and students will have to be established.

The Virtual University of Tunis (VUT), a public establishment of a scientific and technological nature, created in January 2002, has the main mission of developing courses and university programs for online teaching for Tunisian universities. It is responsible for coordinating activities relating to non-presential training provided in Tunisian universities. The VUT offers transversal teaching units (computer science, English and entrepreneurship) in the various university courses. It provides training for trainers in the use of ICT, digital pedagogy and course scripting. The VUT also offers online teaching spaces provided on the "Moodle" platform. It provides establishments with access centers, videoconference centers and digital production laboratories.

The French standardization association (AFNOR, 2008) defines distance education (e-learning) as a training system designed to allow individuals to train without traveling to the place of training and without the physical presence of a trainer. Distance education covers all the technical devices and organizational models that aim to provide teaching or learning to individuals who are distant from the training organization providing the service.

To provide educational support and teacher training (Villani and Torossian, 2018), we are seeing the development of online resources (Cabassut and Trestini, 2015) and distance training systems (Aldon, 2015). The pedagogical orientations of a training, a trainer, a training center, are the basis of the choices of structuring the content and the learning activities presented to the learners (Rodet, 2009). The identification of these options is the preliminary step to locate the elements and the links which exist between them, to interpret the results of these interactions, to determine the pedagogical model which underlies them.

The objective of our research is precisely to expose the way in which these distance teacher training (DL) and support for distance learners are designed and implemented. These representations are also dependent on the training contexts. According to David, George, Godinet and Villiot -Leclercq (2007), the pedagogical objectives (learning to collaborate, disciplinary objective, etc.), the type of target audience and the spatial and temporal methods of carrying out the training (presence, distance, hybrid) are part of the training context.

2. Methodology

Our research is both descriptive and exploratory. It is descriptive in the sense

that it sets out the technical and pedagogical progress relating to distance education, the result of the action plan carried out for the benefit of university establishments, including ours. It is exploratory in the sense that it aims to formulate questions and conjectures as a result of this action for future research.

2.1 Descriptive analysis of data from the questionnaires

A first preliminary questionnaire addressed (online) to the teachers and students of HITSJ (n=1133 participants including 95 teachers; 60 permanent and 35 temporary workers) questioned enabled us to propose a first descriptive analysis of the data collected. This questionnaire was launched at the start of the action by our 4C center. This questionnaire was composed of two parts, one relating to contextual data (feasibility study of online teaching in relation to the profiles of the actors and the technical means such as the coverage of the Internet network and the computer equipment available) and the other on the characterization of the device to be implemented (distance mode, scripting, support, mediation).

A second preliminary questionnaire addressed (online) to the teachers of the HITS network including the HITSJ (n=1169 participating teachers) questioned enabled us to propose a first descriptive analysis of the data collected. This questionnaire was composed of two

parts, one relating to contextual data (the technical means to ensure distance learning) and the other on the added value of the action plan implemented (teacher training, scripting, support, mediation, measurement of satisfaction with distance education, synchronous and asynchronous tools used).

2.2 Descriptive analysis of data from achievements on the platform

A series of indicators presented by the establishment's ELC showed values before and after the confinement period and the completion of the action plan. These indicators provided information on the number of course spaces, the number of teachers who are used to adopting distant learning in our HITSJ, statistics by specialty and by department.

3. Use of DL before the pandemic

In a context and a vision for Tunisia to become an international digital reference and to make Information and Communication Technologies (ICT) an important lever for socio-economic development, national and international strategic plans and missions were realized. Thus, the Virtual University of Tunis (VUT) was founded in 2002, with the mission of promoting distance education (DL) in Tunisia, of disseminating digital culture and of integrating ICT within our educational systems. teaching .

In fact, it is a whole socio-economic policy of the state which aims to integrate the Technologies of Information and Communication for Education (TICE), to find more opportunity for partnership , evolution and international openness.

The Virtual University of Tunis has been offering since the academic year 2014/2015 an online training course entitled IFeL (Online Training Engineering) for Tunisian university teachers.

The VUT is responsible for coordinating activities relating to non-presential training provided in Tunisian universities, by offering cross-cutting teaching units (computer science, English and entrepreneurship in the various university courses), training of trainers for the use ICT, digital pedagogy and course scripting, online teaching spaces, provided on the "Moodle" platform and access centers, videoconference centers and digital production laboratories.

Regarding the evolution of the positioning of the VUT vis-à-vis the universities and their establishments, quite a few universities in Tunisia have adopted a digital development plan and the training of teachers in ICTE remains limited.

In addition to this, on the one hand , the authorized study plans limit the application of distance education, and on

the other hand, a determining factor which blocks the change is related to the system of incentives and remuneration which does not explicitly take into account the activity of the teacher in the digital space which requires a high time investment.

4. The DL in the HITS of JENDOUBA in figures before the pandemic

The Higher Institute of Technological Studies of Jendouba (HITSJ) was created by Law No. 9250 of May 18, 1992 relating to Higher Institutes of Technological Studies. The HITS of Jendouba provides higher technological training organized in four departments:

Department of Computer Technologies (Mobile Embedded Systems, Development of Information Systems , Network Information Systems) .

Department of Economics and Management.

Department of Mechanical Engineering (Industrial Maintenance, Wood Technology, Construction and Mechanical Manufacturing).

Department of Electrical Engineering.

The HITS of Jendouba welcomes for the academic year 2019-2020, 1020 students registered in the various departments including 50 students in Masters and the rest is 970 in license. A team of 60 permanent teachers and 35 part-time teachers.

The commitment of teachers in the use of ICTE in the modules they provide remains low and differs from one department to another.

The Department of Computer Technologies has 17 permanent teachers , only 06 of whom have reinforced their teaching with an online course posted on the VUT platform . Even the number of courses hosted on the platform changes from teacher to teacher . Overall, 24 course spaces have been created. In table 1. a summary showing the detail in figures.

TABLE I. NUMBER OF COURSE SPACE / TEACHER IN THE IT DEPARTMENT

	<i>IT department</i>	<i>Number of Spaces Before COVID19</i>
1	First_Last_name_Ens1 (MT)	9
2	First_Last_name_Ens2 (MT)	0
3	First_Last_name_Ens3 (MT)	0
4	First_Last_name_Ens4 (T)	1
5	First_Last_name_Ens5 (T)	0
6	First_Last_name_Ens6 (T)	2
7	First_Last_name_Ens7 (T)	2
8	First_Last_name_Ens8 (T)	4
9	First_Last_name_Ens9 (T)	6
10	First_Last_name_Ens10 (T)	0
11	First_Last_name_Ens11 (T)	0
12	First_Last_name_Ens12 (T)	0
13	First_Last_name_Ens13 (T)	0
14	First_Last_name_Ens14 (T)	0
15	First_Last_name_Ens15 (T)	0
16	First_Last_name_Ens16 (TC)	0
17	First_Last_name_Ens17 (Math)	0

The Department of Economics and Management has 18 permanent teachers, only 3 of whom have reinforced their teaching with an online course posted on the VUT platform . Even the number of courses hosted on the platform changes from teacher to teacher . Overall, 06 course spaces have been created. In table 2. a summary showing the detail in figures.

TABLE II. NUMBER OF COURSE SPACE / TEACHER IN THE SEG DEPARTMENT

SEG Department		Number of Spaces Before COVID19
1	First_Last_name_Ens1 (MT)	0
2	First_Lastname_Ens2 (MT)	4
3	First_Last_name_Ens3 (MT)	0
4	First_Last_name_Ens4 (T)	1
5	First_Last_name_Ens5 (T)	0
6	First_Last_name_Ens6 (T)	1
7	First_Last_name_Ens7 (T)	0
8	First_Last_name_Ens8 (T)	0
9	First_Last_name_Ens9 (T)	0
10	First_Last_name_Ens10 (T)	0
11	First_Last_name_Ens11 (T)	0
12	First_Last_name_Ens12 (T)	0
13	First_Last_name_Ens13 (T)	0
14	First_Last_name_Ens14 (T)	0
15	First_Last_name_Ens15 (T)	0
16	First_Last_name_Ens16 (T)	0
17	First_Last_name_Ens17 (T)	0
18	First_Last_name_Ens18 (En)	0

The Mechanical Engineering department has 14 permanent teachers, only 6 of whom have reinforced their teaching with an online course posted on the VUT platform . Even the number of courses hosted on the platform changes from teacher to teacher . Overall, 08 course spaces have been created. In table 3. a summary showing the detail in figures.

TABLE III. NUMBER OF COURSE SPACE /TEACHER IN GM DEPARTMENT

GM department		Number of Spaces Before COVID19
1	First_Last_name_Ens1 (MT)	2
2	First_Last_name_Ens2 (MT)	1
3	First_Last_name_Ens3 (MT)	1
4	First_Last_name_Ens4 (MT)	1
5	First_Last_name_Ens5 (T)	0
6	First_Last_name_Ens6 (T)	2
7	First_Last_name_Ens7 (T)	0
8	First_Last_name_Ens8 (T)	0
9	First_Last_name_Ens9 (T)	0
10	First_Last_name_Ens10 (T)	0
11	First_Last_name_Ens11 (T)	1
12	First_Last_name_Ens12 (T)	0
13	First_Last_name_Ens13 (T)	0
14	First_Last_name_Ens14 (En)	0

The Electrical Engineering department has 11 permanent teachers, only 01 of whom have reinforced their teaching

with an online course posted on the VUT platform . Overall, 05 course spaces have been created. In table 4. a summary showing the detail in figures.

TABLE IV. NUMBER OF COURSE SPACE /TEACHER IN GE DEPARTMENT

GE Department		Number of Spaces Before COVID19
1	First_Last_name_Ens1 (MT)	5
2	First_Last_name_Ens2 (MT)	0
3	First_Last_name_Ens3 (MT)	0
4	First_Last_name_Ens4 (MT)	0
5	First_Last_name_Ens5 (MT)	0
6	First_Last_name_Ens6 (T)	0
7	First_Last_name_Ens7 (T)	0
8	First_Last_name_Ens8 (T)	0
9	First_Last_name_Ens9 (T)	0
10	First_Last_name_Ens10 (Fr)	0
11	First_Last_name_Ens10 (Math)	0

As part of the improvement of the quality of teaching in the Masters and following the request of the administration, 14 lesson spaces were created but never used by teachers.

In Figure 1. We summarize the detail in figures for our establishment.

Nombre d'espaces de cours avant covid 19				Nombre d'espaces de cours après covid 19			
Département GE		Département SEG		Département TI		Département GM	
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Fig. 1. Summary statement by departments.

5. VUT action plan

As part of the VUT's support to the various Tunisian universities and with the aim of ensuring the pedagogical continuity of teaching during the period of confinement, the VUT has made its distance learning platform available to the various establishments. Moodle» for

the creation of course spaces and online teaching.

This support is provided through training sessions for teachers on the use of the Moodle platform, which will allow them to furnish their course spaces and provide online teaching for students. A Canadian report (Bracewell & alii, 1996) insists on the fact that ICT can be of use to teachers from a pedagogical point of view.

To carry out this complex task, the VUT has recourse to the various departments of online teaching attached to the universities, to the experts and referents of the VUT and to the correspondents of the online teaching of the establishments.

5.1 Role of the online education department in the action plan

The online education department of the HITS network, like any university online education department, had the role of coordinating and ensuring the fulfillment of the different phases of the VUT action plan.

To decide on the actions to be taken in each phase, the online teaching department has organized periodic meetings by videoconference with VUT experts on the one hand and online correspondents on the other. Several decisions were made such as the choice of the architecture to be deployed for the various distance education platforms (one platform per university), the technologies to be used for

videoconferencing, free access to the platform, the architecture for creating course spaces in each establishment by department and by level of study while respecting the authorized study plans.

5.2 Role of the ELC in the action plan

The E-Learning Correspondents (ELC) of the establishments ensured the creation of the necessary course spaces to provide educational support for students during confinement, respecting the authorized study plans. They participated in the training of teachers on the use of the Moodle platform. They accompanied the teachers during the furnishing phase of the classroom spaces. They participated in the campaign to activate the accounts of permanent and temporary teachers. The ELCs have written companion guides to facilitate the use of the resources and activities offered by the Moodle LMS. They have written guides to facilitate the registration of students on the platform and the registration for the different courses that the student is supposed to follow. They also ensured the follow-up for the success of this action plan.

A charter has been defined for the ELC to support its activities as shown in Figure 2 below.

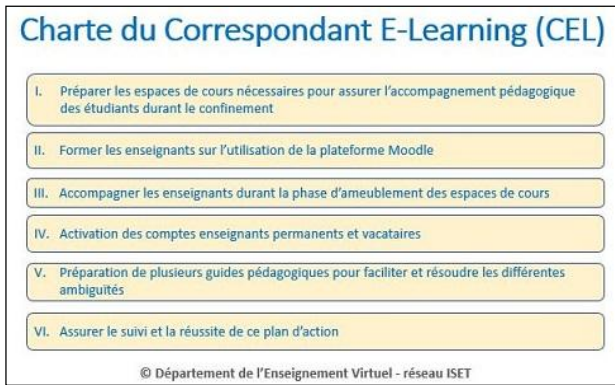


Fig. 2. Charter of the E-learning correspondent (ELC)

5.3 Teacher training

Teacher training on the use of the Moodle platform was offered by VUT. This training lasts one week in self-study. During this week, three meetings are organized with the teachers in training to discuss the various points raised.

The first meeting had as its agenda, the presentation of the various participants, the presentation of the Moodle platform, the personalization of the profile on the platform, the presentation of the instruction relating to activity 2 and various questions.

The second meeting had as its agenda, the scripting of course spaces by adding resources and activities, the addition of communication tools and the answer to various questions.

A third meeting had as its agenda, the management of access to the course space, the configuration of groups, the use of the mobile application and various questions.

Throughout this training, the learner teacher had the “student” role on the training space and the “teacher” role on his own course space which is supposed to furnish him during the training. Learners have the opportunity to test what their students will see on their course spaces, this experience has helped teachers to raise the ambiguities that may be encountered in a given educational scenario.

All permanent and part-time teachers had the right to participate in this training. Three sessions have been scheduled to meet the demands.

This training was provided by the establishments' ELCs and overseen by VUT experts. The content of this training was proposed by a team of VUT experts.

5.4 Pedagogical scenario adopted

During the creation of the course spaces, the VUT experts proposed a pedagogical scenario of a course, as a model, in order to facilitate the task for the teachers.

Through the Moodle content management system (LMS); we have the possibility of creating a course space with four different formats: single activity, informal, thematic and weekly. The choice for the proposed course space was with the thematic

format which presents the course in the form of sections with a layout allowing all the sections to be displayed on the same page with a “separate group” group mode.

These technical and pedagogical choices are because only one course space is open per course. This strategy has forced the teachers who belong to the pedagogical team registered in the course space to work together to furnish and script the content. In this course space, several groups of students are added.

The model course space deployed in the teacher course spaces, is composed of a first section equipped with a label to add the title of the course, an announcement forum to communicate with learners and display the various opinions and recommendations teacher and a link to download the Moodle Android application. Several sections are displayed on the page. Each section is reserved for a chapter. In each section, the title of the chapter is displayed. Below the title, a label is provided to present the specific objectives of the chapter. A label is provided for the resources that the teacher will add. Another for activities with a “homework” activity as an example. A label for communication tools is also placed with a “forum” activity as an example.

This model course space made it possible to unify the pedagogical scenario to be presented to the students and also made it possible to focus the training of teachers on the technical aspects of using Moodle.

The E-Learning Correspondents (ELC) of the establishments ensured the creation of the necessary course spaces to provide educational support for students during confinement, respecting the authorized study plans.

6. The new pedagogical and technical skills acquired

The crisis and the will of all the actors to make the pedagogical accompaniment a success allowed us to accumulate several skills on the technical and pedagogical levels.

6.1 The pedagogical skills of the teaching staff

On our side at the HITS of Jendouba, we had 26.66% of the permanent teachers who make use of the DL to support their courses and accompany their students. This percentage varies according to the disciplines: in the IT department, it is 35.29%; in the department of economics and management, it is 16.66%; in the mechanical engineering department it is 42.85% and in the electrical engineering department it is 9.09%.

Although the staff of part-time teachers represents almost 38% of the teaching

staff of HITS Jendouba, none of these teachers used distance education to support their teaching.

Following the action plan, all the permanent and temporary teaching staff participated in the training sessions offered by the VUT and they were subsequently able to furnish their course spaces and provide remote educational support for their students. Distance learning has enabled teachers to adapt their teaching practices and choose educational activities that are accessible and feasible online in order to help students focus on their own initiative on the learning targeted.

6.2 Technical skills

Technically, the HITS network has benefited from its own distance learning platform like all the universities of the Ministry of Higher Education and Research.

This "Moodle" platform offers each institution its own space to host courses. An organization by department, by level of study and by semester has been established. A "BBB" (Big Blue Button) videoconferencing tool has been integrated into this LMS (Learning Management System) to ensure synchronous educational support sessions.

7. Pedagogical support during the confinement period

In order to apply the circular from the Minister of Higher Education on the implementation of the distance learning system, a first distance meeting was held on Friday March 20, 2020 from 10 a.m. to 11 a.m. to coordinate the implementation methods. In place of the course spaces of the various departments of the institutes and to know the action plan planned by the VUT. The work was broken down into three stages. A first step concerns the creation of course spaces, a second is dedicated to the registration of teachers on the platform and the training sessions and a third step concerns the registration of students and the follow-up and resolution of the various problems that can emerge.

7.1 Deployment of study plans on the Moodle platform *iset.uvt.tn*

On our side at the HITSJ, we ensure the teaching of 16 study plans spread over 04 departments. During semester 2, we created 215 different course spaces with only one course space for a given module. This strategy allowed us to ensure the uniqueness of the content presented for the students and imposed on us a collaborative work between the teachers assigned to this space.

7.2 Adaptation of group schedules

On our side at the HITSJ, the duration of a face-to-face course session is one and a half hours and lessons start in our institute from 8:30 a.m. until 6 p.m. in

the evening. During the confinement period, we have adapted the course session which will be provided remotely in several forms, including videoconferencing to one hour of synchronous support. This adaptation was intended to ensure that the learner did not disengage from the learning process. We have postponed the start of the sessions to 10 am.

7.3 Synchronization of videoconference sessions

Each study plan is made up of more than 12 courses, which is equivalent to an hourly load that varies between 26 and 30 hours per week, i.e. a weekly load of 6 hours. Given the importance of this daily load for both the learner and the teacher, we proceeded to create a file shared by department to set the videoconference sessions and we made sure that the number of these sessions do not exceed two. Exceptionally, three sessions are permitted for a single day of the week.

8. Empirical study of educational support

Our study is based on two surveys, a first launched by the 4C center of our establishment to measure the feasibility of distance learning before starting this teaching and a second launched by the virtual teaching department of the HITS network. once we have completed the educational support.

8.1 Measurement of the Commitment of the teaching staff

Our study is based on two surveys: a first launched by the Career and Skills Certification Center (4C) of HITS Jendouba which revealed that 77% of teachers are for educational support and that 61.51% have already had experience with distance education whether as a teacher or as a student. 88.5% of them have an Internet connection. 65.38% qualify the quality of the connection as good and 26.92% qualify it as average, however 7.69% say that the speed is very low. To ensure distance learning, 65.38% of teachers have either a computer or smart equipment and only 30.77% have computers.

8.2 Measurement of student registration on the platform and in courses

The study launched by the 4C center of HITS Jendouba revealed that 85.13% of students do not agree to use remote education and 14.87% are for this mode of education. This opinion is due to a controversy around equal opportunities and the real feasibility of the proposed solution. 29.72% of our HITS students have an Internet connection, while 70.28% do not. 47.29% of students rate the connection quality as poor. This does not allow them to follow the planned courses remotely. The rest of the students, that is 45.94% qualify it as fair and 6.75% qualify it as good.

Once the course spaces are created and the student pre-registration procedure has been completed by the VUT technical team on the new platform dedicated to teaching for the HITS network, the students was launched, a registration guide was shared for students to facilitate their registration on the platform and in the course spaces to which they have been invited.

Figure 3. below presents the percentage of the best student enrollment rate until April 13, 2020 according to departments and specialties .

Institut Supérieur des Etudes Technologiques de Jendouba				
Département	Semestre	Spécialité	total	Meilleur % inscrits
Technologies de l'informatique	Semestre 2	Tronc Commun	81	38%
Technologies de l'informatique	Semestre 2	DSI2	29	69%
Technologies de l'informatique	Semestre 2	RSI2	18	83%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Génie Mécanique	Semestre 2	Master FRMI	20	10%
Génie Mécanique	Semestre 2	Génie Mécanique 1	81	46%
Génie Mécanique	Semestre 2	CFM2	24	63%
Génie Mécanique	Semestre 2	MI2	33	21%
Génie Mécanique	Semestre 2	TB2	10	20%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Génie Electrique	Semestre 2	Génie Electrique 1	111	23%
Génie Electrique	Semestre 2	AI2	19	58%
Génie Electrique	Semestre 2	EI2	26	35%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Sciences Economiques et Gestion	Semestre 2	Master CEIPA	23	39%
Sciences Economiques et Gestion	Semestre 2	TCF	91	43%
Sciences Economiques et Gestion	Semestre 2	CD	78	36%
Sciences Economiques et Gestion	Semestre 2	CF	55	53%
Sciences Economiques et Gestion	Semestre 2	PM	21	57%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Tous les départements	Semestre 2	2CN	442	52%

Fig. 3. Status of student registrations as of 13-04-2020

Figure 4. below presents the percentage of the best student enrollment rate until April 23, 2020 according to departments and specialties.

Institut Supérieur des Etudes Technologiques de Jendouba				
Département	Semestre	Spécialité	total	Meilleur % inscrits
Technologies de l'informatique	Semestre 2	Tronc Commun	81	43%
Technologies de l'informatique	Semestre 2	DSI2	29	76%
Technologies de l'informatique	Semestre 2	RSI2	18	89%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Génie Mécanique	Semestre 2	Master FRMI	20	10%
Génie Mécanique	Semestre 2	Génie Mécanique 1	81	54%
Génie Mécanique	Semestre 2	CFM2	24	71%
Génie Mécanique	Semestre 2	MI2	33	24%
Génie Mécanique	Semestre 2	TB2	10	20%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Génie Electrique	Semestre 2	Génie Electrique 1	111	26%
Génie Electrique	Semestre 2	AI2	19	58%
Génie Electrique	Semestre 2	EI2	26	35%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Sciences Economiques et Gestion	Semestre 2	Master CEIPA	23	48%
Sciences Economiques et Gestion	Semestre 2	TCF	91	56%
Sciences Economiques et Gestion	Semestre 2	CD	78	44%
Sciences Economiques et Gestion	Semestre 2	CF	55	56%
Sciences Economiques et Gestion	Semestre 2	PM	21	62%
Département	Semestre	Spécialité	total	Meilleur % inscrits
Tous les départements	Semestre 2	2CN	442	55%

Fig. 4. Status of student registrations as of 23-04-2020

8.3 Measurement of distance education success rate in the transmission of knowledge and learning

A thorough analysis of research and evaluation studies of hypermedia in distance education (Dillon and Gabbard , 1999) shows that it is difficult to obtain valid evidence of its impact. The questionnaire launched by the department of virtual education of the HITS network shows that 11.76% of the teachers of our HITS believe that compared to face-to- face education, distance education (DL) makes it possible to transmit information to a rate above 75%. A percentage of 35.29% opt for a rate between 50% and 75%. The same percentage of 35.29% opt for a rate between 25% and 50%. A percentage of 17.64% of teachers believe that the rate is less than 25%, these teachers were opposed from the start to the action of the DL according to the same survey.

8.4 Feasibility measurement according to the departments

At the launch of the action plan for remote education , 100% of the teachers in the SEG department were in favor, 80% of the teachers in the TI department were in favor, 50% of the teachers in the GM department were in favor and 25% of the teachers in the GE department were for.

Figure 5. below presents the percentage of the furnishing rate of course spaces

Institut Supérieur des Etudes Technologiques de Jendouba				
Département	Semestre	Spécialité	total	% cours meublés
Technologies de l'Informatique	Semestre 2	Tronc Commun	81	100%
Technologies de l'Informatique	Semestre 2	DSI2	29	92%
Technologies de l'Informatique	Semestre 2	RSI2	18	100%
Département	Semestre	Spécialité	total	% cours meublés
Génie Mécanique	Semestre 2	Master FRMI	20	50%
Génie Mécanique	Semestre 2	Génie Mécanique 1	81	57%
Génie Mécanique	Semestre 2	CFM2	24	47%
Génie Mécanique	Semestre 2	MI2	33	42%
Génie Mécanique	Semestre 2	TB2	10	39%
Département	Semestre	Spécialité	total	% cours meublés
Génie Electrique	Semestre 2	Génie Electrique 1	111	53%
Génie Electrique	Semestre 2	AJ2	19	40%
Génie Electrique	Semestre 2	EI2	26	24%
Département	Semestre	Spécialité	total	% cours meublés
Sciences Economiques et Gestion	Semestre 2	Master CEIPA	23	44%
Sciences Economiques et Gestion	Semestre 2	TCF	91	91%
Sciences Economiques et Gestion	Semestre 2	CD	78	80%
Sciences Economiques et Gestion	Semestre 2	CF	55	91%
Sciences Economiques et Gestion	Semestre 2	PM	21	82%
Département	Semestre	Spécialité	total	% cours meublés
Tous les départements	Semestre 2	2CN	442	100%

Fig. 5. State of the furnishings of the course spaces on 23-04-2020

On our side at the HITSJ, the teaching covers various technological disciplines. Pedagogical support was impossible for 24 workshop modules, 16 in the mechanical engineering department and 8 in the electrical engineering department, i.e. a rate of 11.16% compared to the total number of courses in the second semester.

The questionnaire launched, after the deconfinement, by the department of online education of the HITS network, shows that for the SEG department, 25% of them are very motivated by the DL, 37.5% of them are still motivated by DL, 12.5% become reluctant while 25% are indifferent. For the IT department, 25% of them are still motivated by DL, 25% become reluctant while 50% are indifferent. For the GM department, 25% of them are still motivated by DL, 50% become reluctant while 25% are indifferent. Teachers in the GE department did not respond to our questionnaire.

8.5 Measurement of the impact of teacher training in DL

Before the VUT training action, 32% of permanent teachers use distance education to support their teaching, this rate becomes 16.84% of HITS teaching staff, if we take into consideration that we have temporary teachers who participate in teaching.

The teacher training campaign was provided over three sessions and 53 teachers benefited from this training, either a rate of 55.78% of all teachers. The permanent teachers of HITS participated with a rate of 88% of the permanent staff. Part-time teachers participated with a rate of 25.71%.

The result of this campaign and the choice to create a common course space by course was beneficial. The work by a teaching team of teachers to furnish each space has made it possible to have a furnishing rate of 100% for most of the course spaces for the various specialties. Exceptionally, 24 course spaces remained empty, either a rate of 11.16% compared to the total number of courses in the second semester.

9. Discussion

During the period of confinement, distance education has been adopted in several countries around the world. Institutions of higher education have made use of this teaching technique.

Digitization has proven to be indispensable for the global economy to

continue functioning in this time of crisis (Shkalenko and Fadeeva , 2020).

The study of the implementation of these devices (the use of Moodle for the creation of course spaces, the digitization of content by teachers and the training of teachers to provide online educational support) has allowed us to observe the similarities and differences in terms of the specialties of our HITSJ, the pedagogical scripting, the tools used and the achievement of the objectives set.

The teachers lived this experience differently, even if overall the technical and environmental working conditions of the teachers are acceptable. The latter have been able to provide online support, although for many this is the first time they have discovered this type of teaching. The teachers reported three difficulties, on the one hand the absence of contact with the students and on the other hand the quality of the connection, as well as the feasibility of this support for certain courses.

During this period of confinement due to the COVID19 pandemic, teachers have reported that the adoption of active pedagogy has proven to be more effective, positive and powerful in student learning.

For practical courses, Bobroff , Bouquet and Delabre (2020) have identified different alternatives for providing online teaching such as digital simulations, the

use of smartphones which have high-performance sensors to retrieve various measurements and tests. For Frau- Meigs (2020), distance education makes it possible to teach differently, to vary practices and to make the learner an actor in his learning by progressing at his own pace and not at that imposed on all students in the courses. face-to-face. Haag's (2020) results point in the same direction.

10. Conclusion

The mission of support for distance education, led by the VUT, represents a vocation of support and training both at the collective level (the case of the teaching team) and at the individual level. (at teacher level). In this sense, the training provided was a place of advice, resources, training, reflection and exchange on educational and professional practices and experiences. During the training sessions we insisted on the use of the LMS Moodle and the various methods of disseminating information to allow teachers to put their courses online for the benefit of students during the confinement period through an educational policy proposed by VUT for all establishments.

From a technical point of view, the HITS network has benefited from its own distance learning platform offered by the VUT.

On our side at the HITSJ, all permanent and temporary teachers have become able to put a course online. All the courses mentioned in the study plans for the various specialties were available on time for our students, with the exception of 24 workshops whose teachers felt that it was impossible to put them online during this period due to a lack of teaching resources and simulators for these courses.

The survey conducted by the online teaching department of the HITS network showed that 76.47% of HITSJ teachers think that online educational support could have been more successful if it were compulsory. 94.11% of teachers think of continuing distance education via the VUT platform.

It should be mentioned that during the crisis period, the various actors (pedagogical, administrative, institutional) made concrete efforts to ensure educational continuity. Admittedly, technical progress has been clearly noted. This progress made it possible to systematically host the second semester courses in a distance learning platform. This action plan should be reinforced soon by training sessions on the methods of digital online pedagogy and active teaching methods given their weight in the success of online teaching. Haymore Sandholtz, Ringstaff & Owyer (1997), authors of *The Connected Class*, indicate that for

ICT to be used profitably, teachers must agree to "question their pedagogical beliefs".

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