

Stakeholders' Perceptions In The Implementation Of Hybrid Training At The Higher Institute Of Technology Of Antananarivo

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Abstract - The hybridisation of engineering training at the Higher Institute of Technology of Antananarivo is currently an unavoidable step towards totally remote learning. The protagonists' impressions on the training should be known in order to continuously improve the device. Two surveys were thus carried out, one among all the engineering students from the Institute's three Colleges and another one among the teachers involved in it. The objective of the survey is to find out the stakeholders' perceptions in an alternative to face-to-face training. Indeed, the system motivates both teachers and students despite their fear of insufficient internet connection, reduced social ties and pedagogical interactions. Paths are thus put forward to identify the favourable factors in order to be able to issue concrete recommendations and ensure pedagogical continuity whatever the context. Resources and pedagogy should therefore meet digital university educational standards provided that the students own adequate computer equipment and have access to Internet at a lower cost.

Keywords - hybridization, perception, motivation, pedagogical continuity

I. INTRODUCTION

The United Nations Sustainable Development Goal 4 aims to ensure quality, inclusive and equitable education and promote lifelong learning opportunities for all. In Madagascar, the university system is going in the same direction by adopting among its development axes an accessible and equitable quality higher education and among its objectives to make distance training and digital education for accessibility and equity. To this end, the Higher Institute of Technology of Antananarivo (IST-T) received support from the Agence Universitaire de la Francophonie (AUF) for the hybridization of the engineering training of the three Colleges towards the end of year 2020.

In fact, the Institute uses its Moodle platform as an educational support for distance learning and in the implementation of hybridization, one part of the course is online and another part is always face-to-face. These two parts are complementary and the

percentage depends on each teacher. In addition, hybrid training has already practiced in the engineering training of IST-T since 2013 in the form of online refresher training. Each course has three additional modules to be followed completely remotely in Master 1. This hybridization can thus be explained as an extension of this system in the whole engineering training.

Furthermore, within the framework of the implementation of the Institutional Development Plan of the IST-T and starting from its experiences in Online Distance Learning (ODL), the adopted strategy relates to the teachers' motivation and support in the application of the digital pedagogies. Students are also encouraged to learn remotely by using online tools.

The main question of the study is: how is the hybridization of the engineering training at IST Antananarivo going? In order to resolve this problem, the following questions were asked: what are the elements that influence the stakeholders' motivation? what are the apprehensions in the implementation of hybrid training? and what should be done as far as organization is concerned in order to have a functional and efficient hybrid training system?

The objective of the research is to analyse the stakeholders' perceptions of hybrid training. To achieve this goal, we will first identify the negative and positive aspects observed by teachers and students before analysing their impressions and identifying favourable response elements to guarantee the smooth running of the training.

We have taken as a hypothesis: the stakeholders' motivation and confidence in a well-structured system ensure the continual development of the hybrid training system.

Before presenting the state of the art around perception and motivation, we will first describe the materials and methods adopted in this research, then reveal the results and deal with the discussions, and finally conclude with the study limit and the perspective.

II. MATERIALS AND METHODS

The description of IST-T and its engineering training considered as the field of study is presented, before writing the methods adopted in the research.

2.1. The study site

The Higher Institute of Technology of Antananarivo is a public Higher Education Institution in Madagascar. It has three Colleges and an engineering training of Master level in each of them. The engineering training is achieved in 4 semesters and lasts three years due to the fact that the learners are in the workforce. Therefore, they work part time and study part time. In addition, the training has three levels: incoming level 4, outgoing level 4 and level 5. The four engineering courses involved in hybridization of these three Colleges are first the Urban Engineering Development (AGU), Civil Engineering (GC), then the Industrial Engineering (GI) with two options : Maintenance and Production (MP) and Renewable Energy (RE); and finally the Business Management (ME) with two options: Creation of Activities and Projects (CAP) and the Logistics option (LOG). There are 296 engineering students this year. As the Institute currently has 3 ODL with 4 classes, many teachers have been trained and use digital technology in their teaching. However, a series of training courses on the design of educational content was still provided in order to stimulate the others to join the digital education world. As a result, about fifty teachers are involved in hybrid training. As for the students, they attend the two-hour session course on the Moodle platform before taking up the introductory module for online learning in the first year of engineering training.

2.2. Surveys of students and teachers

A survey was carried out to analyse the students' perception of hybrid training. The target is the 296 engineering students from the Institute's 3 colleges.

The questionnaire was broken down into four groups. The first concerns the student's profile and the second is on general training issues. Two questions were asked to the students regarding the advantages and disadvantages of the training before asking them their motivation. The respondent was asked to choose the three assertions that he or she finds most interesting for the positive aspects related to the hybrid training, and the three most apprehended for the negative aspects among the proposals presented in the questionnaire. It should be noted that the respondent could add other points that he or she considers relevant. The third group of questions contains technical questions related to the platform, and the last is a question about their feelings on educational continuity. This questionnaire was inserted via the Google Forms form and the survey was conducted entirely online.

The survey carried out among the 58 teachers revealed their profiles, their motivations, their apprehensions as well as what they saw as the training strengths. The questionnaire was sent via Google Forms for temporary employees and some of the full-time teachers. The other teachers received it in hard copy.

The statistical analysis of the data obtained from these questionnaires allowed us not only to know the realities in the implementation of the training itself, but also to make corresponding recommendations.

III. RESULTS

Before presenting the results of the surveys, some definitions of the research concepts are given.

3.1. Perception and motivation

According to Lieury (2008), perception is defined as the process of receiving and interpreting sensory stimuli. It brings together all the physiological and psychological mechanisms whose function is the collection of information in the environment or in the body itself and its processing [1]. However, the meaning of visual, tactile, auditory and olfactory information is derived from the knowledge and previous experiences of the perceiver. Perception then takes on meaning through the interpretation of the data perceived by the individual, that is to say through the meaning of the piece of information. Perception differs from one individual to another according to his or her personality and relates to a frame of reference, developed from his or her personal and social experiences. Three levels of processing are distinct in the perceptual process: the sensory level which relates to the reception of environmental data, the perceptual level which relates to the organization of sensory data and the cognitive level which relates to the interpretation of perceptual data. This last level of processing corresponds to mental representation.

It is from the latter that we have defined perception as an activity through which a subject experiences objects or properties present in his or her environment. It is linked to the cognition mechanisms. The way in which the individual perceives himself or herself and perceives the activity he or she performs, thus constitutes a major determinant of his or her motivation.

To define the concept of motivation, French-language dictionaries provide a legal definition of the term. The motivation corresponds to the justification of an act and the statement of the reasons for a decision. The concept of motivation as an object of research appears for the first time, it seems, in the work of the psychologists Tolman (1932) [2] and Lewin (1936) [3]. The one that appeared to be the most representative of the contributions of major psychologists is that of Vallerand and Thill (1993): "The concept of motivation represents the hypothetical construct used to describe the internal and / or external forces producing the triggering, the direction, intensity and persistence of behavior "[4]. This is a process that is initially triggered by the action of an inner motivational force. It can also be triggered by an external motivational force which depends on the situation, the learning environment, the nature of the training, the mode of management, etc. These internal or dispositional, and external or situational motivational factors are changing and specific to each student. The level of motivation can "be either weak or strong, varying both between individuals at specific times, and in the same person at different times, and depending on the circumstances" [5].

3.2. The survey results of teachers

About thirty teachers, or 51.72%, including 10 women and 20 men, gave their opinions on the questions asked. Half of these respondents are over 50 years old and they mentioned as advantages of the system the reduction in the risk of contamination from Covid-19, the saving of time and the reduction of trips.

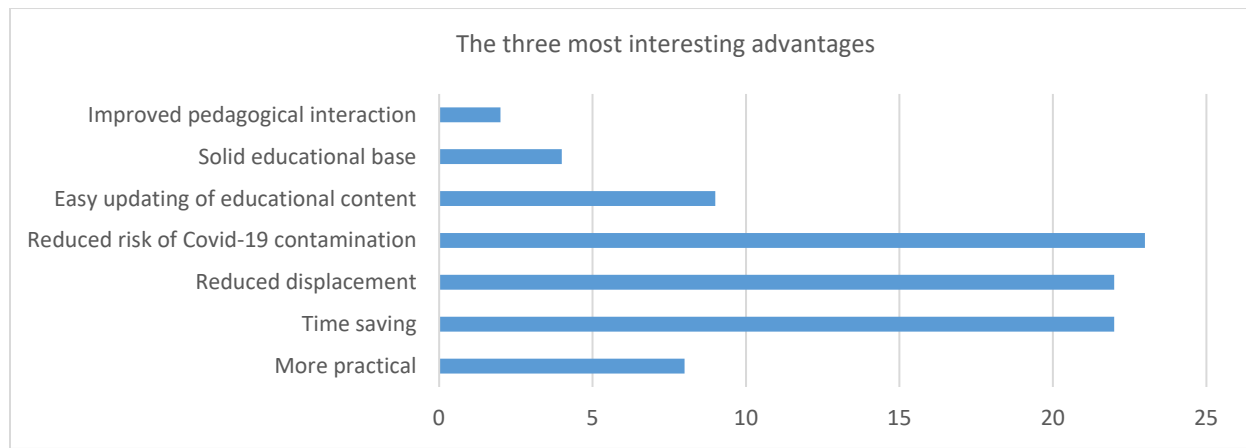


Fig. 1. Positive perceptions

However, 60% of respondents fear the lack of internet connection and 46.67% dread the students' unequal access to knowledge. The additional workload for the digital educational content design and the degradation of the teaching quality are also among fears in addition to the decrease in social ties.

Almost all respondents believe that the training will ensure educational continuity in the event of lockdown. In fact, the implementation of hybrid training motivates 86.67% of teachers.

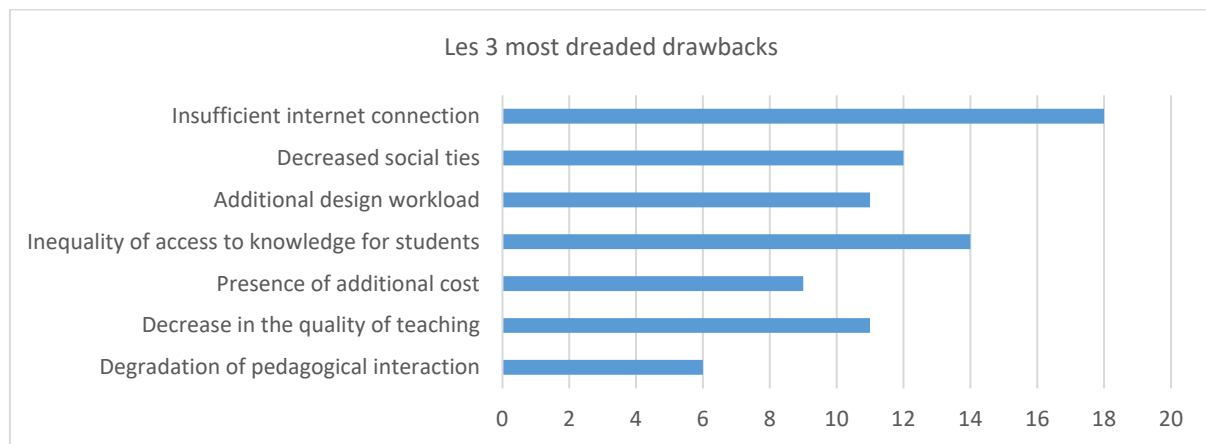


Fig. 2. The apprehensions

3.3. Student survey results

One hundred and seventy (170) engineering students out of 296, of which 47.6% were women and 52.4% were men, responded to the online survey carried out at the end of June 2021.

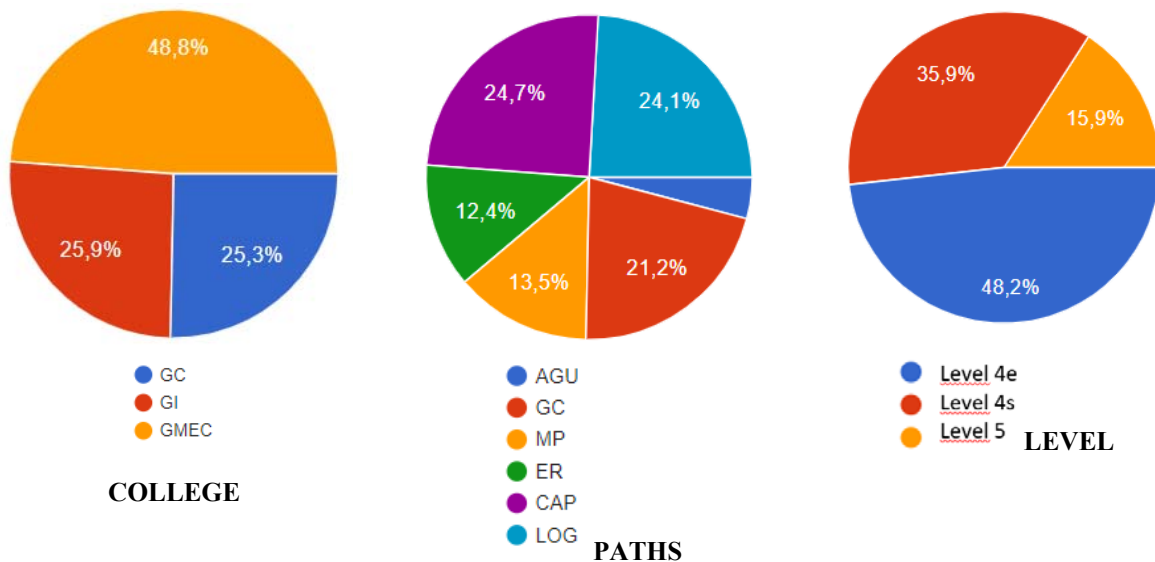


Fig. 3. Students' Profiles

They cited reduced travel, time savings and freedom to organise as the most interesting benefits.

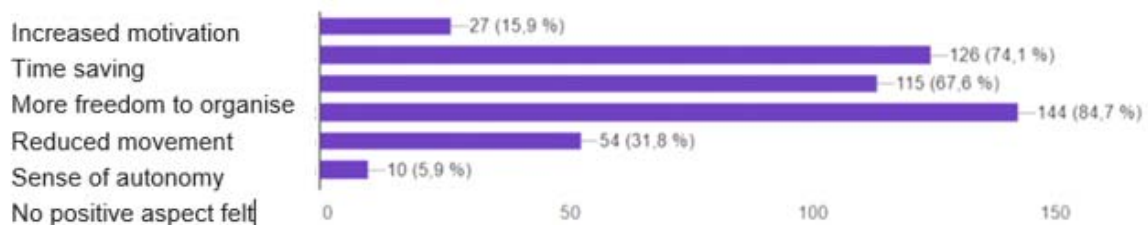


Fig. 4. Positive perceptions by students

However, 61.2% of respondents found the insufficient internet connection as the first negative aspects, the decrease not only in social ties (52.9%) but also in educational interactions (38.2%).

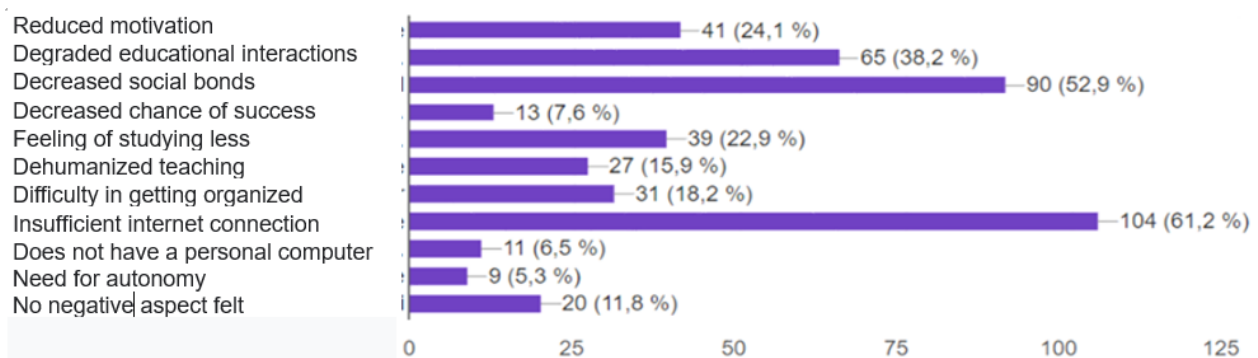


Fig. 5. Student apprehensions

Almost all students (95.9%) have no difficulty in working on the Moodle platform.

170 réponses

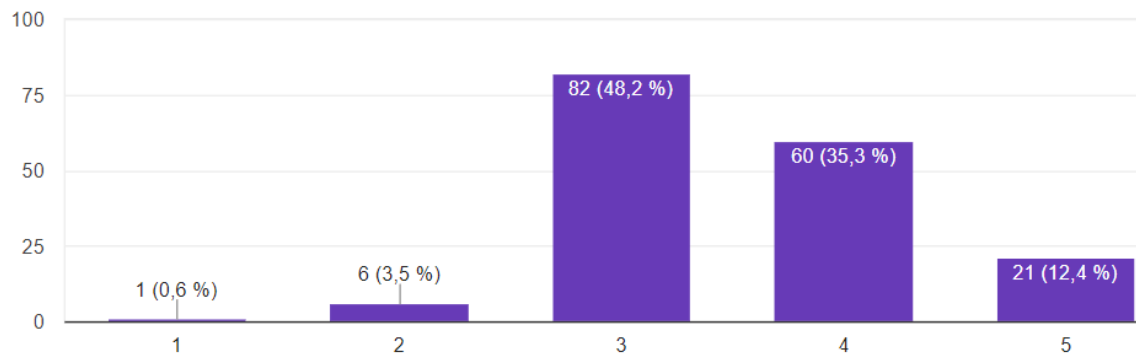


Fig. 6. Use of the platform

Ninety point six percent (90.6%) say the platform is also easily accessible, and 83.6% of students are motivated to take up the training.

170 réponses

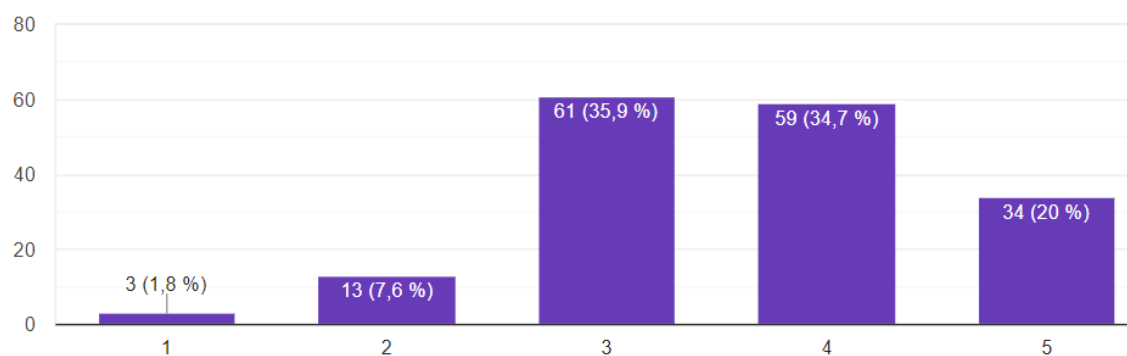


Fig. 7. Accessibility to the platform

Almost all students think that hybrid training could ensure educational continuity in the event of lockdown. Two students nonetheless clearly mentioned the need for support and assistance with equipment, especially in internet packages which are not yet within everyone's reach.

IV. DISCUSSIONS ET RECOMMENDATIONS

To solve the problems identified during the implementation of hybrid training, a few solutions will first be proposed before stressing the importance of motivation and distance tutoring.

Getting started with Moodle and following an introductory e-learning module [6] are among the reasons why engineering students at the Institute will be able to work easily on the platform. The implementation of hybrid training motivates both teachers and students. Nevertheless, they fear on the one hand, the lack of internet connection, and on the other hand the decrease in social ties and educational interactions. Moreover, teachers fear that the teaching quality will deteriorate.

4.1. Suggested solutions

To resolve the various problems identified, a few solutions are put forward. The Institute's partnership with telephone operators in Madagascar is necessary in order to reduce as much as possible the costs of the connection to the platform dedicated to the training. Technological watch and the popularisation of training on the educational content digitization and distance tutoring for all teachers are still important. It should be noted that distance tutoring could still provide a link between teachers and students as distance group work can lead to interactions among peers in their collaboration and is therefore strongly encouraged. In fact, tutoring

helps prevent students' loneliness. With the design of content according to the standards required in digital university pedagogy, hybrid teaching sessions should always be recorded in the class textbook and follow the schedule given by the pedagogical manager. The Institute should also put in place a control system in order to always ensure the teaching quality. Regarding the organisation, each College has an educational coordinator and the technical coordination is entrusted to a single entity to guarantee the proper functioning of the system.

TABLE 1. SUGGESTED SOLUTIONS

Apprehensions	Suggested solutions
Insufficient internet connection	- Partnership with a telephone operator in order to obtain the minimal possible connection cost to the platform dedicated to training
Decreased social ties	- Distance tutoring insurance - Encouraging the use of communication tools via platform
Decrease in pedagogical interactions	- Distance tutoring insurance - Encouraging learners to collaborate remotely - Designing group activities and encouraging the use of remote collaboration tools
Deterioration in the quality of teaching	- Old technology - Perpetual updating of digital competence - Making course design meet digital university pedagogy standards - Distance tutoring insurance - Setting up a control system within the Institute - Recording all sessions (face-to-face and remote) in the class textbook

4.2. The importance of motivation and distance tutoring

The motivating reasons for the students are the accessibility to the Moodle platform via mobile artifacts and their initiation to e-learning [6] when gathered in the first session of the refresher training. In distance learning, motivation is also linked to the learner's goals. It is closely linked to the perception of the usefulness of learning tasks, to the way in which the learner can get a concrete idea of the transfer in the context of the knowledge he or she is building. Since motivation and learning are closely linked, they are therefore mutually reinforcing [7]. To ensure an optimal motivation level, the task at hand should neither be too difficult (at the risk of creating obstacles and frustration), nor too easy (which would cause boredom). The right balance must be found to stimulate the learners' motivation and help them move forward in their learning journey to develop the skills they need. Educational content should be well balanced and take into account the hybridization of training as well.

The results obtained on the students' apprehensions highlight what Quintin found in 2008 on the importance of tutoring, as well as that of group work [9]. Tutoring has an important place in distance learning for students given that tutorial interventions help learners to collaborate. They are thus very diverse and marked by the different collaboration phases. The tutors' actions help the learners to carry out their tasks and achieve their goals by bringing their collaboration to life [8]; and it is the latter that strengthens social bonds between peers, and between teachers and students. Quintin (2008) highlights that tutoring targeted to the socio-emotional dimension has a positive effect on the process with regard to group cohesion. He also underlines that this better relational climate positively influences the quality of the product of learning carried out in a group and, as a corollary, the individual progression of learners at the end of the apprenticeship [9].

V. CONCLUSION

In implementing the hybridization of its engineering education, IST-T uses its Moodle platform as a support for distance learning. It was judicious to analyse the stakeholders' perception of the system in order to resolve the problems raised. Consequently, we were thus able to collect all the stakeholders' apprehensions : they fear the lack of connection as well as the decrease in social ties and educational interactions. It should also be noted that teachers particularly fear the degradation of the teaching quality and the additional workload, while some students doubt that the training is complete.

Regarding the motivations, the actors think that hybrid training reduces travel and saves time. According to teachers, hybridization reduces the risk of contamination from Covid-19. As for the students, they find that this system gives them more freedom to organise.

Solutions have been proposed not only to obtain a functional device but also above all to reassure the stakeholders. Technological watch and the popularisation of design and tutoring training for all teachers are still necessary. The Institute's partnership with a telephone operator is also important in order to reduce as much as possible the connection cost to the platform dedicated to the training. The initial hypothesis is therefore confirmed. The hybridisation of the current training could lead to a completely remote initial training. In fact, this system would minimize face-to-face sessions and reduce the risk of contamination provided that the educational resources are available online on the platform, that the teachers are competent in digital education and finally that the learners are equipped with material resources.

The study was carried out at the start of the implementation of hybridisation of engineering education, and is only of interest to students and teachers. The analysis of the perception of all those involved in the training after a full academic year should thus be carried out in the aim of making a comparative study. This analysis would ensure continuous improvement of the system and guarantee pedagogical continuity.

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