

REQUIREMENT OF HIGHER EDUCATION PROFESSIONS IN TERMS OF SKILLS

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Abstract- The concept of competence is not restricted to students alone. Students' skills can only be developed if teachers are qualified and hold those skills themselves. Every profession requires a set of qualification standards to ensure performance outcomes. Professional standards reinforce the professional skills of senior teachers. It is critical to evaluate the performance of teaching practice as a consequence of student performance. Our previous study focused on the gap between saying and doing in the teacher-student relationship. A questionnaire was distributed to beginning students (1st year university). This sample represents the category that receives the greatest impact from the High School-University transition. The study revealed that more than half of the students encounter major difficulties at the level of the concepts and basic applications of the notion of "mathematical sequence". This observation can be justified by the deployment of pedagogical methods in a random manner. The universities are confronted with several constraints which make the teaching practice more delicate, namely the massification and the management of learning time.

Keywords: Professional Competence, Professional didactics, Higher Education, Teaching Practice, Didactics of Mathematics.

1. INTRODUCTION

The Moroccan university is no different from international universities. It succeeds with brilliant promotions. But it does not have professional standards that evaluate the performance of teaching practice. The challenge of our research is to show, through a comparative methodology, that there is a causal correlation between the competencies of senior teachers at the level of skill and the performance of students in the academic cycle. The teacher-student pedagogical relationship influences the learning process.

In 1985, Chevallard defined the didactic interactions between these two poles. All work demonstrated through outstanding performance. It is the teacher's professional competence that evolves the student's performance. For

over 30 years, teacher training has been a major issue for countries. It is important to consider the knowledge and professionalization of the discipline taught. The topic of a repository of skills is always present at the institutional level; it is declined in ethical values (Quebec), the standards of employment (United States) have experimentation of evaluation (England). (Ghallab, 2017) in his publishing, stated that teaching pedagogues must be associated with evaluation methods of teacher training. He stated that it is necessary to "Encourage, throughout teacher training, innovative pedagogical skill, capitalization of good practices and experimentation, sharing in networks, pooling of resources and skill via mobile laboratories or tools" (teaching kits, for example). The thesis of (Jane Fridman Bittencourt 2008) discussed the didactic analysis. She stated that "teacher education has progressively moved away from actual practice, as highlighted by a large body of work in several countries (Shulman 1986, Barbier 1996)".

The Moroccan university does not require any entry requirements for students in their first year of university. The annual registration rate is increasing remarkably. This overcrowded is the result of two reasons: the low selectivity at the baccalaureate and the high selectivity at the university level. In Morocco, number of registrations increased after independence. University expansion was remarkable. The overcrowded of registration has led to qualitative imbalances. The purpose of higher education teacher is becoming more difficult.

The academic pressure and the university population force him to choose the most reduced methods. He focuses on the management of teaching time more than the quality of knowledge presented. The student presents a challenge with the ideas acquired in high school. The role of the teacher is to support the students in an indirect way during their studies. The lecture halls become too crowded. These causes change the conditions of professional work. The teacher is faced with a difficult task [16].

Anne Barrere, 2017, through her sociological research, states that Teachers suffer, they say, from not seeing their difficulties recognized. The heterogeneity of

university students, resulting from overcrowded. The pressing between an autonomy requiring multiple skills and equally various prescriptions; the composite nature of the teaching profession - teaching, evaluating and the "trials" to be overcome: in connection to the discipline one teaches, to the relationships one has with students, to the feeling of powerlessness one may feel, to the lack of recognition one experiences.

Authors have spoken about professionalization in higher education. They have graded that the concept of the profession exceeds that of the job. At the university, the teacher helps the student to prepare for his or her future profession. "Professionalization smooths the transition, from education to the workforce (OECD, 2013). Every teacher focuses on transmitting his skill to his students. "His interest is in the articulation between practical and theoretical knowledge" (Rose, 2008).

Since 2003, the professional competencies of the higher education teacher become serious. UNESCO addresses the new requirements of the higher education profession. "UNESCO'S recommendations or guidelines (regarding quality, good practices) serve as global benchmarks freely chosen by the many nations that ratify them" (Suzy Halimi, 2021).

Abd Elali Kaaouachi stated, "In Morocco, there is no real policy for evaluating higher education teachers. Even if there is a kind of evaluation that has consequences on tenure and career advancement (promotion and gratification)". The reward of teachers after performance evaluation is paramount. Everything depends on pedagogical quality and scientist production. The problematic of our study discusses the job requirements of teaching in higher education in terms of skills. The success of teaching practice is connected to acquire professional skills. The subject exploits the cause-effect correlation that appears during the learning and teaching processes. Each outcome reveals deficiencies, and student performance is related to the teacher's reactions and professional skills.

The current study discusses the job requirements of higher education. A comparative approach to our previous findings was chosen. The first study focused on teaching practice in mathematics. It considered the didactic relationship between teacher and knowledge and its role during the teaching process. The second study was based on the principles of the high school-university transition. The measurement of the gap between saying and doing revealed gaps in the students' conceptual development. Teacher reflective practice affects student performance.

2. CONCEPTS AND DEFINITIONS

2.1. Pedagogy

According to Michel Fabre, pedagogy is aimed two reflections: A unique reflection on the educational action to improve a reflection that comes from a systematized approach. (Jean Houssay, 1994) claims on the point, that pedagogy must be carried out by the same person who practices and theorizes.

He shows the complexity of this conception in the form of a practical theory: "Pedagogy is the mutual and dialectical envelopment of theory and educational practice by the same person, on the same person".

2.2. Teaching Practice between Pedagogical Methods and Models

The pedagogical method distinguishes a well-defined type of practice, in other words, the way in which the teacher works in the classroom. On the other hand, the pedagogical model performs a theoretical construction. Marie-Anne Pierrard, 1993, has analyzed learning situations according to two models: the investigation-structuring pedagogical model and the Britt-Mari Barth model. Britt's model can be used as an analysis grid for an activity to be studied. A pedagogical model emphasizes the teacher's practice. These practices must be continuing with the different characteristics of the concepts or notions that he or she teaches [3]. Whatever the teacher's practice; it is in a marked relationship with four components.

Table 1. Most applied teaching methods at university

Psychological component	Epistemological component	Psych sociological component	Axiological component
The teacher analyses the mental representations constructed during learning.	The teacher reinvents the concepts that are related to the chosen knowledge.	The teacher adopts the project-based pedagogy for better classroom management.	The teacher aims for his students to reach already planned goals.

The pedagogical model brings out the understanding of reality. It shows an analysis of practice through theory. In another way, the model envisages the learning process and facilitates the teacher's task to understand what happens in his session. Some famous pedagogical models among researchers and pedagogues are cited [2].

2.2.1. The Trans Missive Model

This model describes the mental state of the student prior to instruction. The student is considered as a blank page, he has not yet assimilated any concept. The teacher's action creates a "Transmitter-Receiver" relationship with the learner. The teacher's role is to transmit academic knowledge and the student's role is to pay attention to recurrence and memorize. This model predominates in secondary education as normative. Example of the use of this model:

- A mindful and motivated class
- A student seeking new knowledge
- An educational talk

2.2.2. The Behaviorist Models

Towards the end of the 19th century, B.F. Skinner emerged this paradigm of psychology to observe behavior under the influence of stimuli. Learning follows steps, moving from one level to another through positive reinforcement of correct responses. The teacher's role is to guide and value the students' work.

While the student's role is to do more exercises following the teacher's advice. The advantages of this model are:

- The teacher is active and autonomous
- The student progresses at his/her own pace
- Objectives are well defined
- Assessment is easy and clear

2.2.3. The Constructivist Models

The constructivist model is based on the work of Jean Piaget in 1964, for which the student's behavior is based on his cognitive structure. His theory of operative schemas describes the situation where the student mobilizes his knowledge according to the double mechanism of assimilation accommodation. In didactics, constructivism is defined by learning where knowledge is constructed by the student or reconstructed in a progressive and continuous manner. Constructivism is based on well-defined principles that influence learning:

- Learning begins with the student's own questions of meaning
- Learning requires understanding of primary concepts
- Successful instruction adopts the student's mental models

Assessment provides information about the quality of learning.

2.3. Pedagogical Methods

In a context that discusses the teaching of mathematics at the university. We will be obliged first to present the different pedagogical methods used by teachers to help their students. At the beginning, we will focus on some of the best-known traditional methods before [3].

2.3.1. The Affirmative/Magisterial Method

It is based on an educational talk. The teacher chooses this technique to build new knowledge more precisely theoretical contributions, clear and well-structured with a limited time. It facilitates understanding and memorization. At the university exactly, the teacher adopts this method to start his lesson where the student writes the notes and observes the scientific approach programed on the handouts.

2.3.2. The Interrogative Method

An interactive pedagogy, the teacher doesn't reveal the knowledge explicitly. He motivates the students to find the new knowledge themselves through a series of questions. It is a reflective method that motivates the student to mobilize his or her prerequisites to find relevant answers. At the university, this method is chosen when the number of students allows for discussion during the lesson or tutorial session.

2.3.3. The Demonstrative Method

This is one of the most successful methods, based on practice. The student is led to combine the knowledge already taught to solve the application exercises. This

pedagogy respects some steps to follow; first the senior teacher presents and demonstrates the exercise clearly with all the steps of demonstrations. Then the student is asked to do a direct application exercise where he/she will solve it following the teacher's instructions. Finally, the teacher redoes/corrects the misunderstandings and rectifies the gaps in the requested demonstration.

2.3.4. The Application Method

This method aims at evaluating the required skills. The teacher suggests more complex exercises and case situations. At the university, students in the mathematics section are required to solve more extensive exercises with various demonstrations. For a good result, the teacher distributes the exercise document and explains orally the instructions to follow. He/she specifies a time limit and remains at the disposal of the students to answer questions. During this work, there are teachers who observe the process and the error and others continue directly to the correction. Higher education has developed in application mathematics and is beginning to include ICT and simulations in order to deepen mathematical applications [2].

2.4. Didactic Transposition in Higher Education

The didactic transposition consists in transforming the learned knowledge into the knowledge to be taught. This transposition is divided into two types: the external didactic transposition and the internal didactic transposition [15].

- The external didactic transposition: it is the fact of transforming the learned knowledge to the knowledge to be taught. (Carried out by the Noosphere).
- The internal didactic transposition: it is the fact of transforming the knowledge to be taught to the knowledge taught. (Carried out by the teacher). For the teacher it will be necessary to adapt the knowledge and the disciplinary knowledge retained to be taught. Here we are talking about the choice of sequences, content and strategies.

This work of organization and structuring is all the more important because it is a matter that should not be transmitted in the native form (Michel Verret, 1975) who forged the notion of didactic transposition. He was convinced that "All teaching practices in the main object indeed the prior transformation of this object an object of teaching".

The teacher who wants to succeed in the didactic transposition must proceed to four operations:

- The desynchronization: it refers to the choice of the knowledge, an important stage since all cannot be taught.
- Depersonalization: it refers to the separation of the knowledge from the person.
- The planning of the acquisition of the knowledge: it is about the programming of the learning for a progressive acquisition.
- The publicity of knowledge: It refers to the social control through the teaching programs.

3. HIGHER EDUCATION IN MOROCCO

Higher education leads to unemployment. Students with higher education are divided into two categories: graduates and professionals. The major institute is for the elites because the equal opportunity operation gives the opportunity to many students to pass entrance exams. The belief that the more you graduate, the more you avoid unemployment, in other words, graduating is good, but over graduating can cause problems. Companies need people who know the field and higher education is more theoretical than practical [4]. The work-study program is for those who are failing, the fact of taking classes and working in a company makes the mission difficult. The work requires concentration. Companies prefer work-study programs to train young people and prepare them to work in a professional manner. The best thing to do in these cases is to go to a top school; choosing a school without any motivation is a guarantee of failure. Motivation is the right orientation that characterizes the student's process towards the right job. It is crucial to ask yourself the question before entering a college or university what you want to do [5].

3.1. The Evolution of Higher Education between 1990 and 2017

In a context of higher education, the university organization aims for each reform to ensure the satisfaction of its students. The overcrowded increases and the need for scientific development put a burden on the quality of knowledge and the economy. As we can see, the number of students in higher education has increased by 23 points over the last 27 years [7]. The distribution of the budget for higher education also increases from 3.6 in 1990 to 10 billion dirhams in 2017. The rate of scholarship students remains constant despite all these changes, the reality of dropping out before enrolling in the doctoral cycle and the unemployment rate of doctoral students influence the choice of students to complete their studies after the basic License.

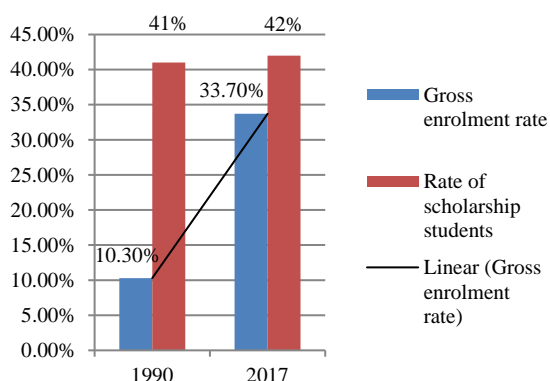


Figure 1. Evolution of Moroccan Higher Education

3.2. Student Failure at Moroccan Universities

Moroccan universities do not require students to meet any entry requirements for the first year of university. The annual enrollment rate is increasing remarkably. This overcrowded is the result of two reasons: the low

selectivity at the baccalaureate and the high selectivity at the university level. The major consequences of such a critical situation are [6]:

- Difficulties in managing heterogeneity in its multiple forms;
- Problems of overcrowding;
- Repercussions on the student supervision rate;
- Effects on the modalities of evaluation of acquisitions;
- Effects on the degree of qualification of students (citizens);
- Effects on training (the credibility of the certificates and degrees prepared).

In 2018, the Ministry of National Education, Vocational Training, Higher Education and Scientific Research, highlighted shocking statistics that testify to the crisis facing the Moroccan University.

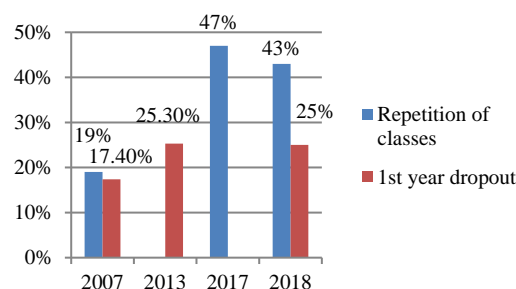


Figure 2. Distribution of the evolution of Moroccan university students

Students are aware that an average of 11 or 10 in the baccalaureate does not allow them to enter the national colleges. The latter require selection criteria that are far from being met by some beginning students. The only way left is the university. But the reality imposes other obstacles than the grade. The major problems that amplify this crisis are widespread in all Moroccan universities:

- The linguistic level required throughout the studies (in French)
- The cost of university life (non-scholarship student)
- The lack of motivation and orientation after the baccalaureate.
- The overload of the program of certain fields of study

The Ministry of National Education attested before the Education Commission that 70% of students have a low level of French language.

3.3. Requirement of Mathematics Teaching at University in Terms of Skills

At the university, mathematics teaching tends to develop the skills required in High school. Having these skills in higher mathematics appears when solving delicate didactic situations [6]. The importance of this teaching enshrines a corner of debate in modern societies. Andrew Hacker, 2012, argues that the loss of many professional talents and academic failures in High school in the US is due to the way this discipline is taught. Internationally, standards for teaching mathematics have been set.

These standards are officially published according to:

- The National Curriculum for England in England
- The Principles and Standards for School Mathematics in the United States
- The B.O. (Bulletin Official) in France

The study made by T. Hassouni, affirms that the student, during his transition from high school to university, needs to consolidate the basic concepts. It is necessary for the teacher to create a relationship between the concept (in physics/mathematics) with practical realization [17].

4. METHODOLOGY

In order to carry out our research, we opted for a mixed methodology that merges the two approaches (qualitative and quantitative). These two approaches will be our tools to make a comparison of the data of our last researches. The first study targeted the teaching practice of teachers of mathematics in higher education. The data of this research revealed the importance of a professional training of the beginner's teachers of higher education before their professional practices. The second publication gave a vision on the gap between saying and doing after the didactic transition High School University among the students. In other words, we were able to collect significant data through a questionnaire that affirms our hypothesis. Now this study connects the two previous studies in order to accomplish the three processes of the didactic triangle already defined. The relationship we are talking about is the Teacher-Student relationship. The comparison of the data reveals gaps in learning and teaching practice.

According to Brousseau Chrisol, 2000, "University institutions that provide teacher training needs teachers who have thought about the problems of didactics of mathematics and who can not only train future teachers of mathematics in their discipline not only but also provide them with a certain mathematical engineering (a set of situations and exercises illustrating the use of each notion of the program) and prepare them for the difficulties they will encounter (conducting lessons, adapting mathematics to the students or to the institutions that welcome them, the limits of learning capacities) Didactic mathematicians are naturally well equipped for this learning" [4].

In this perspective, we will resort to comparing results obtained previously. These results will create a relationship of cause and consequence. The questionnaires distributed to the two different populations (teachers and students), will trace the current statistical study. It will be a work of observation and criticism that will strengthen the comparison. In the first study, the concept of clinical didactics was used. Seventy-three beginning teachers from eight institutions of higher education were selected. Only 56 responses were received. Most of the answers we proposed were closed choice in two modalities: Yes or No. The dimension that interests us the most in this work, that of the "Teaching-Learning" operation, we will only consider the competences that have a reduced appearance among the teachers.

The results reveal that teachers do not take training into consideration. We have placed this state of affairs within the framework of the need to present didactics in higher education, from the perspective of promoting learning rather than teaching.

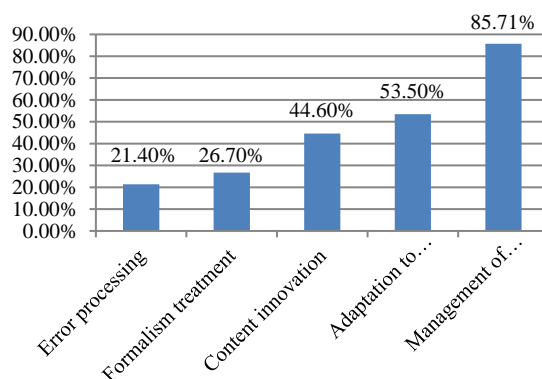


Figure 3. Percentage of responses to criteria promoting student learning

The second study focused on the student-learning relationship. The questionnaire was distributed to 140 new students enrolled in the first year of university. The emphasis was on calculate the gap between saying and doing during the learning process. The study traced the conceptual evolution of the concept "mathematical sequence" from High School to the first year of university. For a fruitful analysis, the methodological approach linked the variations of didactic variables. They define the domain of learning and monitoring of our concept "sequence". [8] The results reveal gaps in students' knowledge. The percentages reveal that more than 50% of the students have difficulties in application and demonstration. The graph below shows the distribution of responses for each question.

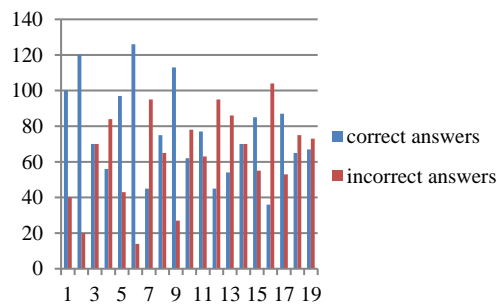


Figure 4. Distribution of answers/question

For a better view on our study, the graph below shows that there is a difference in writing / gender too. Clearly the female category has many learning difficulties on the mathematical side. Less than 50% of the students do not manage to accomplish the tasks requested.

4.1. Comparative Outcome Study

Our sample contains the beginning senior teachers during their teaching practices. The graph below revealed several shortcomings in the teaching process of mathematics especially. They focus more on time management than on innovation and development.

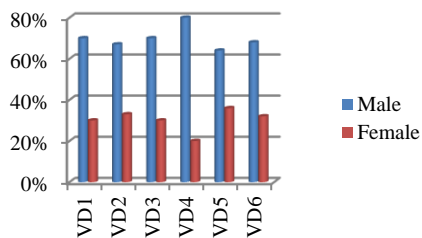


Figure 5. Distribution of correct answers/gender [8]

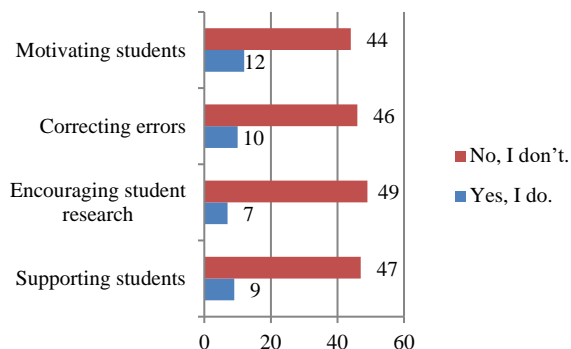


Figure 6. Distribution of beginning teachers in higher education according to their activities [8]

We mentioned earlier that improving teaching requires significant performance. This mission relies on the success of the Teacher-Student relationship during learning as well. Figures 6 and 7 reveal several shortcomings in the teaching process among beginning teachers in higher education. More than 50% of the teachers were found to lack experience and also autonomy. According to our diagnosis, they look to former teachers as models without putting their stamp on them, especially in terms of content management and innovation.

The majority of teachers report that there is not enough time in the session to add activities that build skills in students. Most are more concerned about not accomplishing the mission of the Annual Program than focusing on the learning and teaching practice itself. From experience, causes lead to many consequences. Consequences are the obvious ones that reveal the hidden secrets. For our purposes, the causes are the remarkable percentages in Figures 1 and 2. Senior teachers encounter difficulties during their teaching practice because of the lack of academic training. They made mistakes during practice. The performance of most of the students (more than 70% of the sample) is manifested in the form of didactic obstacles and the accumulation of erroneous requirements. The questionnaire was the tool of our study. Our second research focused on the student-learning relationship. The figure above states that 75% of the students did not acquire new concepts correctly. This leads directly to results in mathematical applications.

5. DISCUSSION OF THE COMPARISON RESULTS

According to McKinsey and Company, 2007, "The highest performing systems are proof that ultimately; it is

the level of teacher proficiency that makes a school system effective". Teacher training is reinforced by skills. A reference framework of competence must be established. Some countries, such as Canada, the United States and England, set ethical values as references for their expectations. Teaching practice is based on the mutual relationship between the teacher and the student [8]. Any relationship progresses according to procedures that must be respected. Higher education is considered the final step for the student. The success of the transition from High School to university is controlled by variables that value the work of the teacher in higher education and the performance of the student. We were able to classify four causal variables that influence the grade and quality of expected outcomes. This is called a correlation relationship, in other words, it is a cause-and-effect relationship. The values chosen determine whether the correlation can be positive or negative depending on the curve of variation of the values of the variables (qualitative/quantitative). The Table 2 explains the correlation that the study focuses on [8].

Table 2. Correlation between cause-and-effect variables

	Variables Causes	Expected consequences
V_1	Lack of content innovation	Decline in new knowledge
V_2	Remediation of error	Increase in misunderstanding
V_3	Student support	Lack of motivation
V_4	lesson planning	disruptive and unorganized student

Based on our last two research studies, we were able to identify these variables. The cause variables trace the quality of the teaching practice. The effect variables reveal the performance of the students towards this chosen teaching practice during the academic cycle. The merging of the statistics leads to the conclusion that when the cause value decreases or increases the effect value varies by the same amount [8].

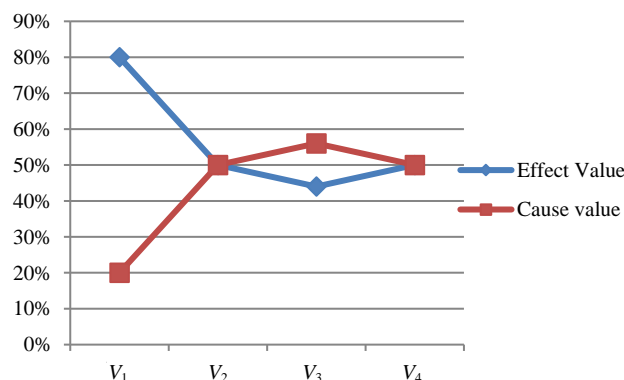


Figure 8. Cause and effect variations in university teaching practice

According to several observations by instructional researchers, "students' progress depends significantly on the talent and skills of their teachers; this is called the teacher effect". "The more the teacher knows what needs to be taught (the syllabus), the more clearly the teacher

will be able to learn, the students will know what to do...". Pascal Brasseur, 2012, emphasizes the motivation and importance of the educational environment. The use of the student-friendly teaching technique is a substitute for working on the error. Errors are the evidences of actions for students. The majority of higher education mathematics teachers neglect the importance of renewable didactic content. Every graduating class of university students expects to have an understandable and clear version or support of the lesson. The teacher effect influence student success. The impact of teaching practice is related to the professional standards that have been established by academic institutions [14].

6. CONCLUSION

Like any profession, teaching produces "defensive ideologies" (Dejours, 1993). The teacher-student relationship influences the work and learning procedures in its entirety. The university needs to put into action training for beginning senior teachers in order to strengthen their professional skills. On the other hand, students are the generation that unveils the gap between saying and doing reveal in front of them.

In conclusion, teaching practice must keep pace with the global innovation in teaching content, and any failure to do so will have unacceptable effects. Brousseau Christol, 2000, "Future didacticians must, in addition to their specific training, acquire a general culture in various fields (psychology, history). This is undoubtedly the price to pay for didactics to keep its place within the mathematical sciences".

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BIOGRAPHIES



Khaoula El Arif was born in Rabat, Morocco on February 03, 1990. She received her Master's degree in teaching and training professions from Faculty of Sciences, Ibn Tofail, Kenitra, Morocco in 2014. Currently, she is a Ph.D. student in Mathematics Didactics and Experimental sciences at the same faculty. She works as teacher of mathematics in a primary school, Kenitra, Morocco. Her research is focused on didactic and pedagogical sciences.



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