Research Paper

The role of the teacher in motivating students Case of mathematics

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ABSTRACT: *Motivation is a physiological and psychological state that pushes an individual to act in order to achieve a specific goal. It is crucial for productivity and success in the workplace. It is the dynamic state in the student that invites him/her to be attentive, committed, and persevere in a learning situation in order to achieve a goal or to be accepted by his/her entourage.*
According to our observations of students in schools, we have noticed a lack of motivation among the majority of them. The signs of this lack of motivation are diverse and numerous: unjustified absences, lateness, indiscipline, lack of personal investment and concentration, insufficient academic motivation, negativity, etc.
In this work, we are interested in finding out what are the causes of demotivation in Moroccan schools. Why students are more and more demotivated? Are teachers responsible for this demotivation, and how teachers and parents should react despite all the constraints?
A bibliographic study and an analysis of a questionnaire was useful to study the following hypotheses:
• There are different causes related to the teacher (teaching methods; pedagogy; techniques), to the content, to the family and school environment of the student (family problems, teenage crisis, bad company, drugs etc.).
• The teacher can motivate the student despite all these constraints.
We conclude our work by giving proposals or solutions to motivate the teacher to give back to the students the desire to learn and engage in the learning process.
KEYWORDS: *motivation, Gantt chart, ISHIKAOUA diagram, BARITO chart*

I. INTRODUCTION

The teaching practices in the teaching of the qualifying secondary classes, we have revealed a lack of motivation among the students in Morocco, presented by: unjustified absences, late arrivals, indiscipline, lack of personal investment, lack of concentration, negativity, drop in grades, indifference towards school activities etc.

This observation raises many questions: What are the causes of school demotivation? Why are students more and more demotivated? Are teachers responsible for this demotivation? Are there other causes external to the school and to the Teacher/Course/Student relationship? How should teachers and parents react despite all the constraints? What are the solutions and how can we make students want to learn again?

In order to identify all the possible causes of schooled-motivation, the following hypotheses are necessary:
• There are different causes related to the teacher, the content and the student's home and school environments
• The teacher can motivate the student despite any professional constraints.

For answer these hypotheses; we begin our work with a theoretical study the different causes of the student's demotivation to learn. Then a practical study is based on the analysis of a pedagogical questionnaire; containing indicators of the effects of the causes of this demotivation applied in 76 students of 380 students (36 students of the Common Core Sciences and 40 students of the 1st year of Baccalaureate Letters) with sampling

of Claude Javeau[1]. When we established the graph of Vilfredo Pareto[2] to define the main causes of the school demotivation.

II.   THE MOTIVATION

2.1 DEFINITION

Motivation is an internal physiological and psychological state that drives the individual to act with a specific behavior in a specific direction to achieve a specific goal; it is crucial for productivity and success in the workplace.

Maher Matalqa defined it as a pre-availability in the personality, which determines the limit of the individual's perseverance in order to achieve success, and this success results in a certain type of satisfaction.

Campbel, Dunnette, Lawler, and Weick (1970) define motivation as the extent of continuous effort the directed achievement of a specific goal.

2.2 ACADEMIC MOTIVATION

Rolland Viau defines academic motivation as a phenomenon that "has its source in the student's perceptions of himself and his environment, and which results in his choosing to commit to and persevere in the educational activity proposed to him, with the aim of learning.

Thus, through this definition, we can see that the motivation to learn is therefore, an internal state of the student that pushes him to pay attention to the educational situation and to carry out a directed activity and to continue in this activity until the learning is achieved as a goal for the student. The student's desire to succeed and reach a certain educational level, or to gain social acceptance from parents and teachers, thus pushing the individual's mental abilities to reach the maximum possible performance during the learning process.

2.3 TYPES OF MOTIVATION

Intrinsic (or internal) motivation is a set of forces that come from the student him/herself, driven by an internal desire to satisfy him/herself, and in the pursuit of experiencing the pleasure of learning, and acquiring knowledge and skills that they like, because of their importance to him/her without the presence of an apparent external reinforcement. [1]

Extrinsic motivation is motivation caused by one or more factors external to the student (teachers, parents, peers, fear of punishment, receiving rewards etc.). The student may be willing to learn in order [2]:
- ✓ to please the teacher, or to gain his admiration and encouragement,
- ✓ to obtain the moral prizes he provides,
- ✓ may be willing to learn to please his parents, the administration,
- ✓ to gain their love and appreciation for his achievements,
- ✓ to obtain from them encouragement of material and moral incentives,
- ✓ The peers also can be a source of this motivation in their admiration or even envy for their school.

2.4 THE IMPORTANCE OF MOTIVATION TO LEARN IN ACADEMIC SUCCESS:

Motivation is an important and necessary condition for learning. It is different from one student to another. Indeed, we can find very intelligent students but due to lack of motivation, their academic level is low, and vice versa. Therefore, motivation is determined by several factors such as the student's conception of school, his or her self-perception and the degree of interest in the activity or subject being taught.

2.5 CAUSES OF SCHOOL DEMOTIVATION

Educational relationships are all the interactions that take place between the student and the teacher; the student and the administration; the students themselves or between the student and the different subjects of learning; they are very important insofar as they directly influence the academic success and personality development of the student.

In the school environment, educational relationships affect students' behaviors, the way they think, feel or act. However, from our observations, there is a relational problem that overwhelms between the student and the educational staff (teachers, supervisors, principal etc.). This could explain the school dropout, violence, drugs …; so what are the causes of this hatred, disinterest in school and this lack of school motivation or complete absence of motivation?

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[1] Claude Javeau (1940-2021) was born in Brussels and he is a professor of sociology and a commercial engineer by training.

[2] Vilfredo Pareto (1848-1923); Italian university professor, engineer, mathematician, sociologist and economist.

2.5.1 THE ISHIKAWA DIAGRAM

The Ishikawa diagram is a tool developed by Kaoru Ishikawa[3] in 1962. It represents in a graphic way the causes leading to an effect. It is also known as a "fishbone" diagram because of its resemblance to fish bones or as a cause and effect diagram because it identifies all the causes that lead to a given situation.
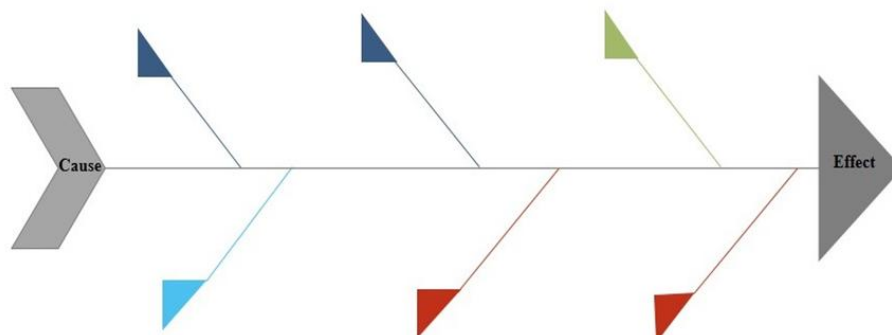
Diagram 1. Cause and effect

2.5.2 THE ISHIKAWA DIAGRAM

2.5.2.1 IN RELATION TO THE STUDENT:
- Neglect and total indifference of the student manifested by frequent absences, no participation in class etc...
- Lack of vision on the social and professional future.
- Lack of self-confidence and shyness that evokes low self-esteem and lack of communication, integration in the class group.
- Development and precocity problem.
- Forget about the prerequisites and the knowledge needed for a new learning.
- Drug addiction, drugs and drug use.

2.5.2.2 IN RELATION TO CONTENT:
- Mathematics block: students think that mathematics is a difficult subject (exact, dry and cold). They are unable to solve simple equations and make no effort to overcome these negative "prejudices.
- Usefulness of mathematics and the famous question "Why are we taught mathematics?"
- Incompatibility of the number of sessions with the school program: the number of hours allocated to teaching mathematics is insufficient in relation to the overloaded program, pushing the teacher to work at high speed without taking into consideration the different learning rhythms of the students or the importance of their participation in the construction of their knowledge
- Multitude of duties of different disciplines is a source of demotivation, lack of desire to learn, lack of leisure or rest.

2.5.2.3 CAUSES RELATED TO THE ENVIRONMENT:
- Students are increasingly attracted to social networks, video games and the use of the internet; they lose a lot of time as well as their ability to concentrate on their studies, which hinders their success.
- Comparison with peers: Parents try to encourage their children to work in class by using comparisons with other students. This practice is very harmful as it can cause the student to hate other students, to hate him/herself and to lower his/her confidence.
- Lack of esteem by parents: parents who underestimate or do not encourage their children enough to make more effort at school because they think they are unable to do so, which can trigger a kind of frustration and demotivation.

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[3] Prof. Kaoru Ishikawa (1915-1989), is a Japanese chemical engineer, professor at the Faculty of Engineering, University of Tokyo

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- Parents' lack of concern for their children's schooling, or parents who are not sufficiently interested in their children's schooling, either because they lack the time or because they are overwhelmed by the demands of school (illiterate parents, for example).

- Indiscipline: normally, the student's autonomy increases his or her motivation more and more. Here we must distinguish between the two concepts: autonomy and indiscipline. The first allows the student to become responsible for his or her learning by respecting the rules; discipline is at the service of academic success and allows each student to become more efficient and to have more self-confidence.

- Family conflicts: the student needs to feel safe at home away from family problems. In situations of family violence, separation or divorce, the student feels confused and suffers in silence. Sometimes he/she turns to drugs and delinquency.

- Overprotection of parents: some parents pay too much attention to their children, giving them everything they want or desire and succumbing to their whims without making any effort. As a result, these children can become lazy, irresponsible, and immature and lose their self-esteem.

- Overcrowded classrooms: the latest international studies show that overcrowded classrooms influence the pedagogical support of students or the teacher is unable to implement new pedagogies and therefore omits the role of the active student in the teaching/learning process, which causes the student to lose the desire to learn.

- Criticism: the attitude of parents who are said "critical" and overly severe towards their children is a factor that partly explains the decrease in self-confidence and the demotivation of students who may become aggressive at school, as a kind of revolt or revenge.

I-5-2-4 STAKEHOLDER-RELATED CAUSES:
I-5-2-4-1 TEACHER-RELATED CAUSES:
- Ignorance of the specificities age of the student: if the mathematics teacher does not take into consideration the heterogeneity of the classes, then he/she does not try to diversify or adapt his/her teaching methods to improve learning by taking into account the needs of each student without leaving room for interactivity and the desire to learn.

- Authoritarianism: The abuse of authority in the classroom by the teacher causes students to question his or her role, and harsh punishments cause them to hate the teacher, discipline and the school. As a result, they will no longer be motivated and will not want to learn.

- Teacher demotivation: certain material and psychological constraints push the teacher to face very important difficulties that badly influence his relationship with the students as well as the efficiency of the teaching/learning process.

- The teacher/adolescent relationship: the qualifying secondary cycle is a period of adolescence where many biological and psychological transformations take place that can cause conflicts with some teachers.

- Ignorance of modern pedagogies: the introduction of new pedagogies and recommendations aims to enhance interactivity in the classroom and optimize learning acquisition (Givvin, K. B., Stipek, D. J., Salmon, J. M., & MacGyvers, V. L. (2001)).

- The abstract aspect of mathematics: the reliance on routine exercises and standard methods of solving abstract exercises instead of using problem solving and the integration of interdisciplinarity, make the acquisition in mathematics hard and specific.

I-5-2-4-2 CASES RELATED TO THE ADMINISTRATION:
- One of the roles of a good school administration is to enforce discipline (attendance, obedience, dress, etc.) and to check that everything is according to the program in the right conditions. However, the role of the administrative staff can be limited to establishing order, which can cause negative ideas about the administrative staff and a certain repulsion from the school and everything related to it.

I-5-2-5 CAUSES RELATED TO THE MATERIAL:
- - Lack of equipment for the integration of ICT; the integration of new information and communication technologies in education facilitates learning and the work of teachers, motivates students and varies learning methods (digital manuals, software, fun activities, etc.). However, in the absence of digital resources, an electrical network, training and supervision, teachers work with the old method, which is insufficient to motivate students in an era of constant technological progress and the introduction of distance learning.

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I-5-2-6 CAUSES RELATED TO THE WORKING METHOD:

The disadvantages of adopting the so-called "transmissive" teaching method are that the student is passive, and receives knowledge, that will be evaluated by feedback; this method prevents the teacher from going out of his or her comfort zone, from coming into contact with the students, and from losing class control or esteem.

All the causes of school demotivation in the following Ishikawa diagram:
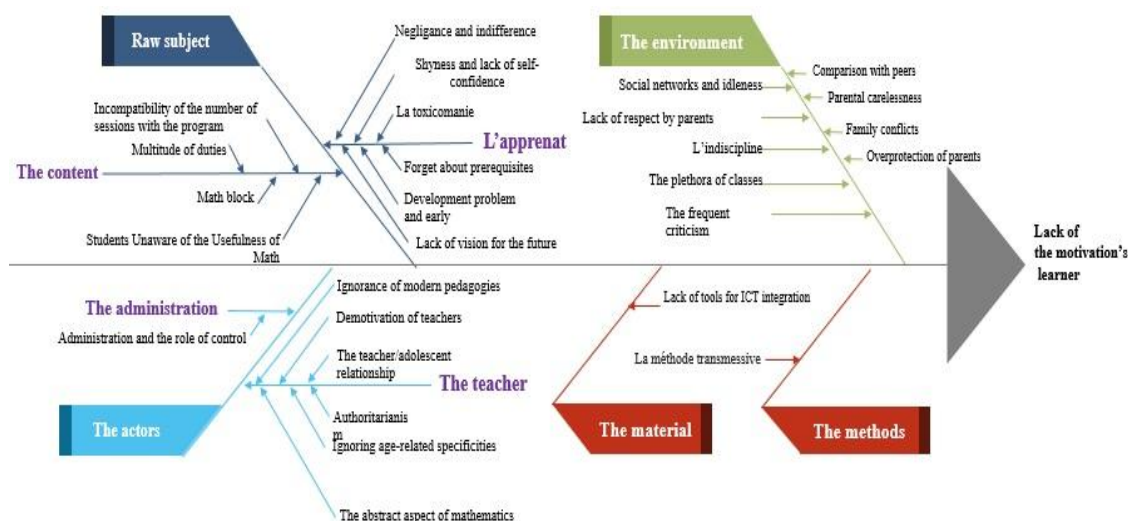
Diagram 2: Ishikawa diagram of school demotivation

III. PRATICAL STADY AND DATA ANALYSIS

3.1. RESEARCH STATUS

In this section, after having made a precise and global statement of the causes of school demotivation, which are the raw material (the content and the student), the environment, The employees (teacher and administrative staff), The means (tools) and the work methods

However, in order to analyze the involvement of each causes in school demotivation's student; a research based on the analysis of a pedagogical questionnaire, containing indicators of the effects of these causes.

Our sample is 76 students out of 380 (36 students of 1st year of high school science and 40 students of 1st year Baccalaureate option letters high school) with sampling of Claude Javeau (1982), then we will establish the graph of "Vilfredo Pareto" to define the main causes of school demotivation.

After having determined the main causes of school demotivation in our sample, an investigation with 17 inspectors and pedagogical advisors in mathematics as experts in class, to remedy these causes and propose solutions and recommendations.

We have compiled the data in the following table:

Questions	Yes	No
Do you like school?	48	28
Do you like the math session?	45	31
Why do we teach mathematics?	44	32
Do you have difficulties in learning mathematics?	47	29
Are you doing extra hours in math?	50	26
Do you suffer from marginalization within your family?	61	15
Do you smoke?	70	6
Do you have family problems?	57	19
Do you feel ashamed to ask questions in class?	36	40
How many hours have you been away this year?	423	
Have you been absent in math this year?	27	49

Do you have trouble concentrating in class?	47	29
Have you forgotten your previous knowledge in mathematics?	11	65
Does Facebook keep you so busy that you forget your math homework?	28	48
Do your parents compare you with your academic peers?	54	22
Does your family make you feel successful?	14	62
Are your parents uninterested in your academic performance?	58	18
Do your parents guide you in your schooling?	28	48
Do you suffer from the length of the program?	48	28
Do you complain about excessive homework?	32	44
Is a crowded classroom a barrier to understanding the lessons?	19	57
Are you often criticized in class or at home?	48	28
Do some teachers not let you express yourself freely?	44	32
Do the administrative staff respect you?	41	35
What are your plans after graduation?	35	41

Tab 1. Table of indicators for demotivation

3.2. ANALYSIS OF RESULTS:
We have evaluated the degree of influence of each of the causes identified in the previous chapters, which we have placed in the following graph:
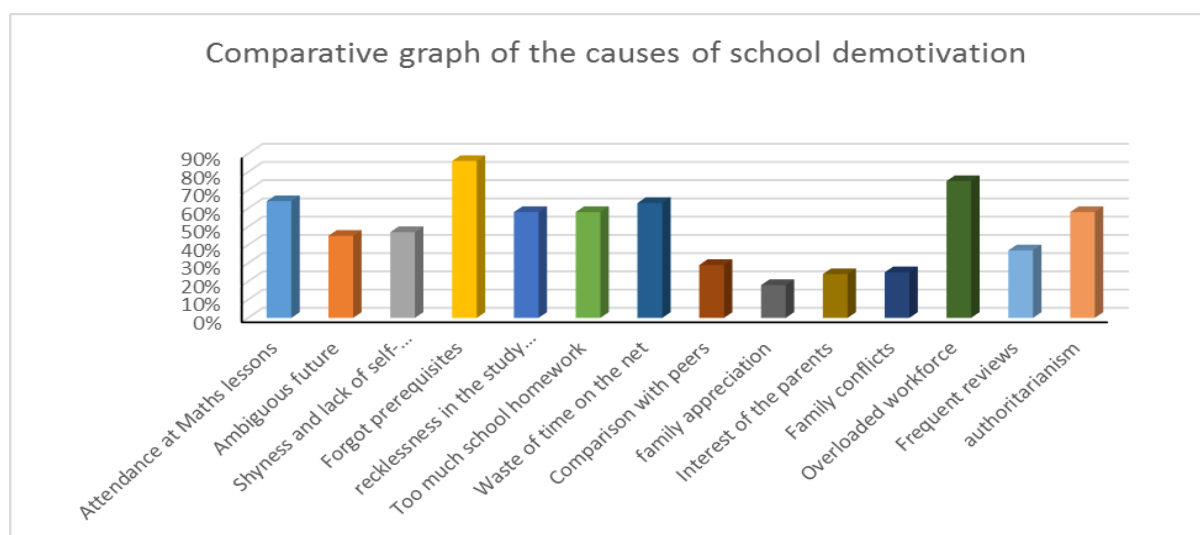

Figure 1. Comparative graph of the causes of school demotivation

3.3. READING DATA :
We notice that:

▪ More than half of the learners who completed the form were absent from the mathematics course and the number of hours of absence is equivalent to 556 hours.

▪ The number of learners who do not have a determined vision of their future reaches 54% of the total learners in the study; knowing that having a clear vision of the future is an essential condition for academic motivation and its absence in 54% of learners is alarming.

▪ Almost half of the learners in the study experience shyness when asking questions in class. Namely that in our educational systems a model learner must be docile, obedient, wise and must respect all the rules without discussion. However, this model gives us a generation that is afraid to speak out.

▪ The study of any new mathematical concept must be built on a solid foundation of prerequisites; however, 86% of learners have forgotten the prerequisites for new learning.

▪ With regard to smoking, we found six students who smoked out of 76 students who participated by filling out the form, which represents almost 7% of the learners in the same sample; figure which significant and

dangerous in this age period.

▪ A student, who ignores the usefulness of mathematics, cannot passionately accept mathematics, and the percentage of such students reaches 58% of the total students.

▪ Too much homework is an obstacle to pushing students to love learning, because the student cannot find an outlet outside the school environment and practice his various hobbies, and thus develops a negative feeling towards school. The percentage of students who suffer from this problem is 58%.

▪ Social networks and electronic games: It is rare to find - at present - a learner who does not have an account in one or more social networks. These networks in addition to electronic games, consume a long time of the student's day, such as the percentage of students, they are busy with Facebook at the expense of doing exercises at home 63%.

▪ Comparison with Peers: When the student does not achieve the required academic excellence, the family is quick to do is to compare him to his peers of more successful students without taking into account intellectual skills and multiple intelligences. This is what our study showed. We found 22 students suffering from their situation compared to their peers of exceptional students out of 76 students.

▪ Family appreciation: 14 pupils suffering from low family appreciation out of 76 pupils, a significant figure given the reflection of this action reflects on the pupil's self-esteem.

▪ Parent's interest in student success: No one is more committed to a student's academic excellence than their parents. However, unfortunately, we found 18 students who suffer from a lack of interest from parents for their success on the 76 students who participated by completing the form.

▪ Acute family conflicts: 19 students with family problems at home out of 76 students who participated by completing the form.

▪ Overcrowded class: In an overcrowded class, not everyone has the opportunity to express their opinion, ask questions and therefore not everyone can interact with the course, which constitutes an obstacle to their understanding of the lesson.

▪ Frequent criticism: Frequent criticism weakens the student's self-esteem. In addition, in our society, this is a widespread behavior, and this is reflected in our study, since the number of students suffering from this problem reached 28 out of 76 students.

▪ Authoritarianism: It is not possible to raise a generation with healthy personalities and capable of creativity in all areas, if it is not brought up to respect freedom, and this necessarily involves its enjoyment of freedom of word and deed; but our situation in this regard is not honorable, we find that authoritarianism is the dominant characteristic in the learning environment whether at home or at school. In view of the above, the results of our study are normal and 58% of the students previously prevented from expressing themselves freely.

3.4. PARETO CHART:
By grouping the percentages in descending order and by calculating the cumulative percentage, we have:

The causes	Workforce	Cumulative number of employees	Percentage	Cumulative percentage
Forgetting the prerequisites	65	65	10,37	10,37
Overworked staff	57	122	9,09	19,46
Carelessness to learn	49	171	7,81	27,27
Waste of time on the internet	48	219	7,66	34,93
Too much schoolwork	44	263	7,02	41,95
The usefulness of math	44	307	7,02	48,96
Lack of vision for the future	41	348	6,54	55,5
Shyness and lack of self-confidence	40	388	6,38	61,88
Role of the administration	35	423	5,58	67,46
Indifference of the parents	28	451	4,47	71,93
Dedicated program and duration	28	479	4,47	76,4
frequent criticism	28	507	4,47	80,86
Paid overtime	26	533	4,15	85,01
Comparison with peers	22	555	3,51	88,52

Family conflicts	19	574	3,03	91,55
Lack of follow-up by parents	18	592	2,87	94,42
Marginalization within the family	15	607	2,39	96,81
Lack of family appreciation	14	621	2,23	99,04
Tobacco addiction	6	627	0,96	100

Using the data in the table above, we create the percentage scale and the percentage polygon, resulting in the Pareto chart shown in the figure below:
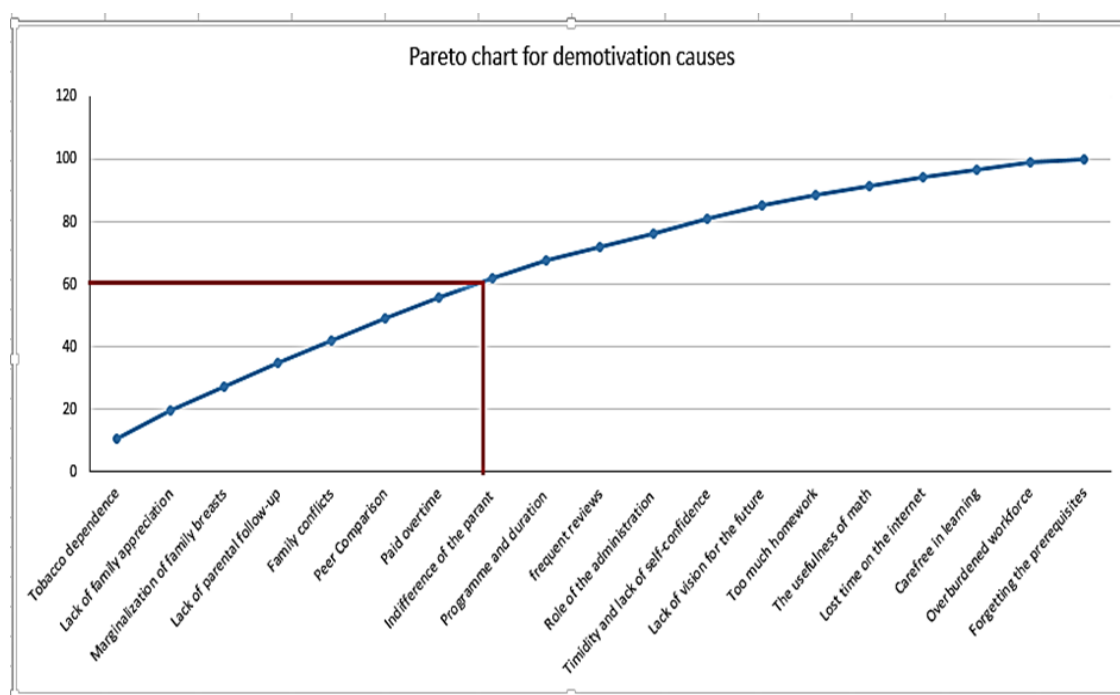

Figure 1. Pareto chart for demotivation causes

IV. CONCLUSION AND RECOMMENDATIONS.

We conclude through the Pareto chart that more than 60% of the problems of low motivation to learn are due to the following reasons:
• Forgetting the prerequisites
• Overworked staff
• Carelessness to learn
• Waste of time on the internet
• Too much schoolwork
• The usefulness of math
• Lack of vision for the future
• Shyness and lack of self-confidence

Among the solutions and recommendations proposed by 17 mathematics inspectors and educational consultants, we note the following proposals in "The Role of the Teacher."
➢ To solve the problem of forgetting the prerequisites
Conduct a diagnostic assessment at the beginning of each lesson and each session to review and diagnose prerequisites in order to progressively correct weaknesses revealed by the diagnostic assessment for coaching and remediation.
➢ For carefree learning:
- The teacher should not present the content too quickly at the end of the session because the goal is to enable the student to achieve the target abilities and objectives, not to unload what the teacher has prepared.
- Reinforce the importance and love of science in students through guidance and direction.
- Contribute actively to the life of the school.

- Give the student some freedom to relieve the pressure on them.
- Be sure to call students by name to reduce psychological barriers and get closer to the student.
- Frequent use of motivational phrases, rewarding good answers, motivating participation and creating a kind of challenge within the section group
- Teach with games to create competitive, fun and motivational learning.
➢ For concern with social networking sites and electronic games:
 Creation of web pages or web applications to provide remote training and support.
➢ To solve the problem of too much homework:
- Coordination with teachers of other subjects to avoid the accumulation of homework in time.
- Integrate information and communication technologies into the teaching of mathematics by providing students with interactive exercises to complete at home.
- Application of interactive remote exercises.
➢ For the lack of vision on the future and career:
- Inform students of the academic opportunities available to them in the future.
- Develop instruction on school counseling, with colleagues in other subjects.
- Help the student determine early on his future goal to motivate him to learn.
➢ For shyness and lack of confidence:
- Talking to shy students at recess
- Avoid making fun of a student if they make a mistake.
- Ask easy questions of shy students.
- Encourage students to write on the board.
- Getting closer to students
- Group work
➢ For the usefulness and importance of mathematics :
- Remembering the role of mathematics in everyday life
- Linking the content taught to other school subjects
- Select problem situations from different sciences
- The role of mathematics in language studies and in the social and educational sciences
- The epistemology of mathematics and its role in the construction of civilizations
- The relationship of mathematics with information and communication technologies
- The role of mathematics in the field of computer science

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