

Psychological Conditions of Learning the Mathematics Course in Secondary Schools of Luwowoshi District in Lubumbashi

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Abstract: *Since our childhood, we have always been stuck with problems of understanding and application in the mathematics course. Having grown up, we receive the students seeking our help to get them to overcome the same difficulties that we had experienced when we were on the school bench, and this, in a more or less perpetual way even though we do not. We are not mathematicians but by the fact that in the national curriculum of primary, secondary and vocational education in the DRC, the mathematics course is enrolled almost in all classes. In an effort to help solve this problem, which we consider stubborn, we asked students and even some teachers about the psychological learning conditions of this course. We will not hesitate to mention both psychopedagogical and ergonomic conditions because in psychology there is no behavior without stimulus. In other words, there is no reaction without action. So that they do not stop the students from being applied in the mathematics class, all these conditions (psychological, ergonomic and even psychopedagogical) will be evoked because we consider them all as stimuli to the problem we want to deal with. We exchanged with the students and even some of the class teachers we met occasionally, outside of their school environment, because we felt that they would feel more comfortable a neutral medium. Then, we went down to these schools to observe by way of confirmation of the facts that were reported to us during the exchanges with our respondents. It is with the help of the method of investigation assisted by techniques of structured interview and observation that we expect to know the psychological, ergonomic and psychopedagogical conditions in the learning of the mathematics course in the students of the district Luwowoshi of the annex commune in Lubumbashi.*

Keywords: Conditions, Psychology, Learning, Mathematics and School

1. Introduction

Since we have known the school environment, from primary school to high school or even higher and university, students still complain about the problems of non-understanding and application in the course of mathematics, something we have known and are aware.

Having received the students of the high school of non-scientific and technical sections, in the case of our country, the DRC, asking us to help them to solve the mathematical exercises submitted to them as homework; finding that there are a lot of courses for which we do not get too many complaints about nor understanding or application, we did a retrospection and a question came to our mind:

In what psychological conditions do the students of Luwowoshi High School in Lubumbashi study the mathematics course?

Our goal is to know the psychological, ergonomic and even psychopedagogical conditions that hinder the students to apply in the mathematics course.

Our research will interest everyone:

1) Researchers

They will be able to go down to schools to explore each aspect of this research. We cite the psychological, ergonomic or psychopedagogical aspect.

2) The Congolese State (DRC)

He may review the teaching programs of different courses in general and mathematics in particular. It will still be able to

boost its supervisory body, which is nothing more than the inspectorate of primary, secondary and vocational education, so that the latter feels the finger, with a lot of attention, the conditions of learning that we are going to note in the lines that follow.

3) School authorities

They will be aware of all the discomforts that prevent students from adapting to different courses in general and mathematics in particular to implement remedial measures.

4) Teachers

They will be informed of the errors that they sometimes unconsciously commit, as we think, in the exercise of their profession so that they avoid them so as not to harm the students who are the main agents of the teaching.

5) Students

They will be made aware of how to behave not only vis-à-vis this course but also teachers of it (the mathematics course).

6) The parents

They can denounce bad school practices received from their children in the form of complaints against school authorities and even vis-à-vis politico-administrative authorities.

7) To everyone

Everyone will take their share of responsibility and act with knowledge of causes. We plan to approach our research using the assisted inquiry method of directed interviewing and observation techniques. Our research was carried out in the Luwowoshi district of the Annex commune (city of

Lubumbashi) during the period from 2015 to the present day.

2. Notional Aspects

a) Condition

According to JEUGE-Maynard (2012, p.248), a condition is an external circumstance to which people and things are subjected...

For GUY ROCHER quoted by MUKENDI TUNSELE (2011, p.18), the condition is the set of elements of the situation that favor or disadvantage, that activate or slow down and that encourage or delay the influence of a factor or several factors of social change.

For us, a condition is a situation arising from the physical and psychosocial environment in which one finds oneself to undergo, act and react.

b) Psychology

Psychology is defined as a scientific study of psychic facts according to JEUGE-Maynard (2012, p.891).

For us, psychology is a motivational science of the behavior of the living according to their environment.

By this definition, several controversies can arise, but on our part, we believe that each reaction to a stimulus is always conditioned or influenced by several factors, two of which seem to us more important. It is the motivation of the body and the physical and psychosocial environment. Our point of view is justified by the fact that in psychology the same stimulus can cause several different reactions depending on the individual and even the same individual when he is in one environment or another.

c) Learning

It's the action of learning. Learning is according to MUSIAL and al. (2012), change during one's life to adapt to one's environment. According to the site www.imsat.fr, learning is the acquisition of new knowledge.

It also means, according to PIERRON quoted by the same site, "adaptive modification of behavior during repeated tests". According to www.googleusercontent.com, learning is understood as the acquisition and development of memory and behavior, including skills, knowledge, understanding, values and wisdom. It is the result of the experience and purpose of teaching.

d) Mathematical

For the site www.en.wikipedia.org, mathematics (or mathematics) is a set of abstract knowledge resulting from logical reasoning...

According to the website www.lumimath.univ-mrs.fr, the Petit Larousse illustrated 1994 gives the definition of the following mathematics: "science which studies by means of deductive reasoning the properties of abstract beings (numbers, geometrical figures, functions, spaces, etc.) and the relationships established between them.

e) School

According to the website <https://en.wikipedia.org/wiki/school>, a school is an institution where students are called "pupils" or pupils so that teachers can teach them collectively.

According to IPAM (1993, pp. 667-668), the school is defined as an institution that can accommodate individuals called schoolchildren in order to teach them collectively (see <http://www.wikipedia.org/wiki/>). 89cole). It still considers it to be an institution in which education or training is provided, at different levels, from nursery or primary school, through the teacher training college, to the national school of education country administration.

For the new dictionary Larousse (1971, P.360), the school is defined as:

- An institution providing a general group education for school-age and preschool children.
- All students and staff of an educational institution.

For our part, the school is a school institution in which one develops the physical, intellectual, moral and / or religious capacities of men to transmit to them a useful knowledge for the society.

Primary school According to the website www.eduscol.education.fr, primary school is by definition the first degree of education. It is the basis on which training is built which should lead young people to the highest level of qualification and prepares them for their life as citizens.

Primary school is also called basic education. Its mission is to instill in the child the basic school knowledge. It is thus an educational institution organizing an education for children aged 6-12, or 7-12 years old (school age).

IPAM (1993, p.64) emphasizes that without alienating the spiritual and moral attitudes that are dear to specific aspirations and that determine cultural identity, primary school would be able, provided it is given the opportunity, to contribute to model the mentality in the desired direction and to make it accord to the imperatives of today's development-oriented society. As a result, the primary school is for children aged between 6, 8 and 12, 14 years old.

Necessity of the school

For MWENZE WA KYUNGU (2007, pp.18-19), apart from innate acts, everything must be learned. It is through school that every individual comes to strategic positions in one or another area, which gives them the power and the capacity to act in their society.

We accept that nothing can be done in the positive sense of life without training and information (school); she is the very meaning of life. We also say that professional exercises are sometimes a function of studies done.

The precise determination of the profession to be exercised is limited when one does not have an intellectual background or better a diploma of a considerable level of

study. The fair practice of a profession requires a possession of knowledge that is consistent with that profession.

We can then add an idea that tells us that no person can occupy a large place without going through school and no professional promotion can be done without going through training or school. So, school is a big necessity in the life of man. Thus, the training at school presents an important phase of access to the working life of all who wants to be responsible.

This job raises the person to a level of value, a respectful social status and leads to self-esteem; that is to say, the school prepares the learner for life. It is the duty of the State to advocate educational structures with a utilitarian and practical educational policy. We stigmatize the school and society report here. School remains an appropriate institution to develop the skills that society needs for its growth, prosperity...

This is why PIERRE ERNY, quoted by MWENZE, says this: "Education appears in a way as the culture itself transmitting, perpetuating, updating itself in a new generation, making every effort, its organization, its resources, its genius, to ensure its durability, thanks to it, children who grow up, become parents, representatives and instruments and mediators of this culture".

In short, the purpose of the school is to develop in the learner personal resources, judgment, reasoning, critical sense; to help it emerge and build itself for a harmonious life in society.

As a result, ANNE FRAPPIER (1964, PP.37-38) says that school is a crossroads of influences. he shows the necessity of the school institution by saying that: "The school is therefore an advanced post in the fight against all the powers of destruction and discouragement, the masters are the pioneers of an action that is just beginning at to engage and which is commanded by the magisterial turn taken by a humanity in a state of gestation ". The school appeals to the best of man.

What are the aspects of these conditions which we will verify on the psychological, ergonomic and psycho-educational level?

Psychologically

For Elie, psychology studies the following elements:

- a) The active life: we see the instinctive life (tropism, reflex and instinct) and the will.
- b) The emotional life: we see the fundamental affects (pleasure and pain), emotions and feelings.
- c) The representative life: we see the sensible knowledge (perception, memory, imagination, association of ideas and attention) and intellectual knowledge (thought and its operations: idea, judgment and reasoning, intelligence and the psychological subject: personality, character and consciousness). These are the aspects of these three elements mentioned above that we will observe in our study.

Psychopedagogically

The psychopedagogy is according to MWENZE Wa Kyungu (2016: 21), "a young science of education which is interested in the teaching of fluidity. It takes into account the personality of the learners during the teaching-learning process".

For his part, MIALARET (1987) uses the notion of "psychopedagogical attitude" as an awareness of psychological factors for teaching. According to the site www.fastef.ucad.sn, the psychopedagogy is a discipline fusion between psychology and pedagogy where one teaches at the same time the psychology of the learner (the child, teenager or even the adult) and general pedagogy.

It is thus, according to this same last site, a discipline located at the confluence of several other domains whose objective is to understand and to enlighten the educational action. This point of view is also supported by PASTIAUX (1997) who emphasizes that: "it is not only pedagogy that must merge but rather all the human sciences likely to contribute to the illumination of educational action. These will enable us to grasp the meaning of psychology".

Psycho-pedagogical science is very important because it will inform us about the educational context, the knowledge of the course contents as well as the materials to be used, the curricula or even the characteristics of the students.

It can also provide information on the choice and definition of course objectives, the use of teaching methods (techniques, processes and modes), the conduct of learning activities and predictive assessments (within programs), formative (within the teaching) and summative (at the end of the realization of a sequence or totality of a program of learning).

Ergonomically

GRAHAM and BENNET (1992: 91) define ergonomics as the study of the mutual adjustment between individuals and their work. For Professor KABAMBI (2003), ergonomics is the systematic study of the design of equipment, machinery of equipment (including everything concerning the design of control boards, signals, controls), methods of research that takes into account the basic anthropometric, anatomical, physiological and psychological characteristics of man.

According to Professor TSHILONDA Kasol'a (2015: 6), the ergonomics factors are fourfold:

- a) The workstation: is it sitting or standing? dimensions, spaces for movement and safety distance; forced postures; the lifting of loads as well as the monitoring and the maintenance of the installations
- b) The organization of work: we see the operating methods and the means of work; work planning and training; working time and breaks; job evaluation and compensation as well as the margin of responsibility and decision-making.
- c) The content of the work: we see if it is too limited or too important; under-occupation and monotony as well as overwork.

d) The work environment: it shows the temperature, the lighting, the noise, the risk of accidents and diseases as well as the social risks.

These are the elements of these four ergonomic factors mentioned above by the eminent Professor that we will try to observe.

3. Methodological Aspect

Our field of investigation is the commune Annexe, in the city of Lubumbashi in the Democratic Republic of Congo, DRC in acronym.

Our sample is random and occasional, especially since we only interviewed students and some teachers they met outside their school environment. We interviewed 126 students and 13 secondary school teachers who did not teach the mathematics course because in psychology, as part of the observation, it is difficult to be at the same time "observant subject and observed subject".

We proceeded by the survey method defined by CHAUCHAT H., quoted by Anne-Marie LAVARDE (2008, p.147), as "the whole of the research procedure that goes from the theoretical models to the analysis and the interpretation of the data".

The latter is assisted by the guided interview technique, which is the one in which "an interview guide is pre-established, including the questions according to a certain order, and the researcher uses them while facilitating the interviewee's understanding of the questions beyond the comprehension of this one from the point of view language, vocabulary, context etc. (KUNDA Kapwata, 2018) but also, and above all, by the technique of indirect observation, which is the observation of facts, phenomena to be studied via an interlocutor who can, in turn, transmit them to the researcher.

For this technique to retain its value, the researcher must rely more on the facts and phenomena with a high frequency of appearances according to the report of several interlocutors.

Being incomplete, this technique has been supplemented by the technique of direct observation, which is the one in which the researcher finds, by means of his own senses, the facts and phenomena he studies.

The answers from our interview as well as from our observation allowed us to describe the psychological, ergonomic and psychopedagogical conditions of learning in the mathematics course in the schools of the Luwuwoshi district that we present in the following lines as results of our research.

4. Results

We have arrived at the end of our field research guided by our initial questions raised in the following way:

In what psychological conditions do high school students in Luwuwoshi district in Lubumbashi study the mathematics course?

After interviewing our respondents who are the students and some teachers not giving the mathematics course, and after the field observation by ourselves, we arrived at the following conclusions:

Concerning our concern, certainly, there are difficulties of adaptation in the course of mathematics which are due to the three following conditions:

Psychological conditions:

- The lack of interest from some students, who do not find the importance of the inscription of this course in their program, hinders from the start the difficulties of adaptation in this discipline.
- The perception of this course is not favorable or teachers of this course are poorly perceived by students. They consider this course to be their "pet peeve".
- Students in non-scientific streams are not motivated to take the mathematics course because they do not understand the merits of this course in their life. Thus RIVOLIER (1989) thinks that "it is because the person feels that there is something to gain or lose in the situation that it comes into action". NUTTIN (1980) believes that the individual who has objectives, sources of motivation in the energetic and directional sense, uses the resources and constraints of the situation to achieve them.
- Mathematics is a stress course for students. Thus LAZARU and FOLKMAN (1984) state that the individual is stressed when he feels, rightly or wrongly, that his abilities and skills are not up to the demands of the situation. They add saying, "that is why the individual refers to a representation that he has optimal conditions for success or failure in the situation; a feeling of anxiety or tension invades him.

Psychopedagogical conditions

- In the teacher training program in the DRC, there is no course in learning psychology that is not to be confused with the developmental psychology course they study in their school curriculum. Added to this is the presence of teachers who have never undergone any preparation in teaching didactics. So they have science but they do not know how to transmit it.
- We found that there were even some mathematics teachers who were not qualified as mathematicians. This may compromise a psychopedagogical principle evoked by an author in this sense: "to teach as short as a finger, one must know long as an arm".
- In relation to the teaching of the mathematics course, BARNIER (2001) proposes the tutoring effect as a teaching
- Learning system in which learners help each other to overcome their difficulties and learn by teaching themselves. This is valid for some students who master the mathematics course and who can in turn, especially in a language adapted to their peers (classmates), transmit the knowledge to their classmates.

- The illustrations proposed in the books used within the schools must be sectorized taking into account the realities of the environment. That is to say, every concept used during the transmission of mathematical knowledge must have a concrete and non-abstract representation in the environment of these students; We found that there are mathematics teachers who have never received any qualification in this field and there are those who have but use terrorism considering that it will be superman or even extraterrestrial to be able to understand and master this science; which is not good and true.

Ergonomic conditions

- In our sphere of research, there is no school that can be found, within each classroom, benches arranged in tiers that can allow each student to perceive the written on the board;
- The benches are not adapted to the anthropometric conditions of the students who unfortunately are not arranged according to the size but are arranged according to the order of arrival because in DRC, studies are still paying in high school and parents are struggling to educate their children and bring them to school gradually as they earn money;
- There are also overcrowded classes where the number of students expected to sit on a bench is exceeded. This hinders the good concentration of students during different learning.
- The construction of sixty-five per cent of schools in this district does not conform to the standards provided by the National Education Inspectorate which are eight meters long, seven meters wide and four meters high. Failure to comply with this recommendation leads to suffocation in classrooms that do not allow for proper concentration of students and may hinder the assimilation of the mathematics course;
- Many of these schools in this neighborhood are not connected to electricity. This leads to the problems of classroom lighting, which increases during the rainy season, which unfortunately covers a major period during which the school year is spread (almost seven rainy months in ten months of the school year) because, once the sky is cloudy, it is very dark in the classrooms;
- Others of these schools are not even fenced, which will cause difficulties in the management of the discipline.

5. Conclusion

All educational partners, namely the State, the school administration, the parents and the pupil who is the beneficiary of it, must contribute, each in his own regard, to the establishment of conditions likely to favor the acquisition of new knowledge.

Even if the conditions treated in this article are at three levels: psychological, psychopedagogical and ergonomic, the only man knows how to act on these factors that he can direct according to the achievement of this or that other objective.

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