

STRATEGIC MANAGEMENT: APPLYING REVERSE OSMOSIS THE TEACHING-LEARNING PROCESS IN THE SCHOOL R.O IN ACTION

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ABSTRACT

That things of the world are in twos is no lie; a position that favours the existence of Osmosis. Osmosis as the process by which water molecules move from an area of higher concentration to that of lower concentration across a semi-permeable membrane recognizes that, owing to the fact that more of a certain things are in a place while less of it are close by, a situation tending towards equilibrium is created, and things from the concentrated region will move towards that region where things are sparse. It takes place in the physical world where the water of high salinity of the Mediterranean Sea and that of lower salinity of the Atlantic move up and down, giving rise to never-to-end ocean currents ; it is why breathing takes place in man . In the spiritual realm, Osmosis holds too! During creation, all spirits were in the heavens, leading to spiritual vacuum on earth. This made spirits arrived at the earth. However, the reality of Osmosis alone is not the be-all of this issue! This paper will be based on: a) Osmosis and , from here , leap into its reverse , b) Reverse Osmosis. In Osmosis per se, ‘Less concentrated solutions contain more free energy than more concentrated solutions so, solvent molecules tend to move from less-concentrated solution area to a region of higher concentration in order to equalize free energy until dynamic equilibrium is reached’. At equilibrium, water continues to flow at opposite direction to stabilize the equilibrium. In Reverse Osmosis, water molecules moves from higher concentration region to lower concentration region. This paper is the application of this process, the process of Counter-Osmosis, to the teaching-learning process.

Keywords: Reverse osmosis, equilibrium of water, Mediterranean Sea

INTRODUCTION

We are not going to enjoy the full spirit of teaching as a process must less improve it to optimum, if we are not able to relate it to the process of Reverse Osmosis, how water molecule moves from an area of higher concentration to that of lower concentration, (Reverse Osmosis on Alibaba.com Mozilla Firefox) .The knowledge of a particular topic is, ipso facto, more in the teacher, and so, more concentrated in him than in the student. This shows that knowledge of a particular subjects or topic in the teacher, at the giving end, is reversely osmotic in having to migrate from where it is higher to where it is lower, in having to flow from him to the student in whom the knowledge is less concentrated (Nweze, 2004: 149).

Thus, in this paper, efforts will be made to show how to improve the teaching-learning process of the teacher-student relations in the bid to tilt the teacher’s knowledge: student’s knowledge ratio in favour of the student. This is because the lesser the teacher’s knowledge: student’s knowledge ratio, the more effective teaching-learning process has become and vice versa.

Yes! This is the proof.

Let the teacher's knowledge be 20.

Let the student's knowledge be 4.

Then, teacher's knowledge: student's ratio = $20/4$.

= 5.

But with the application of this paper, the student will learn more,

Or increase his/her knowledge to a point beyond 4, say, 10.

This gives a better teacher's knowledge: student's knowledge ratio of

$20/10 = 2$.

The reduction of the ratio from 5 to 2 shows a more successful teaching-learning action.

The above is to introduce the reader to the aim, objective and import of this discourse.

LITERATURE REVIEW

In this section, it is imperative to highlight some of the intellectual ejaculations of some earlier writers on the issue of Osmosis and its application – Reverse Osmosis.

Osmosis / 112283848794591 notes that one needs sleep with his books in the belief in Osmosis. Though the urge of this belief is not made clear in the article, the declaration is a pointer to the fact that osmosis is very vital to man and all he stands for; and since, itself, is important, its converse, Reverse Osmosis, must be applicable, too.

Another thing! Even if a human action stops, the aftermaths of such action can still be felt at the side of both the producer and the sufferer, a fact credited by the view of Answer. Com Wiki Answer that "even when osmosis "stops", water will still diffuse in the opposite directions at an equal rate to ensure equilibrium." This show that when teacher has taught and student has learnt, a point shall come when knowledge will flow, not only from the teacher to the student, but also, from the student to the teacher.

Another writer observed that Osmosis is fluid and that the fluid existence of osmosis makes it look like diffusion. Though we say osmosis is fluid, it not, however. The materials are physical, but the process, is abstract which abstractness can be likened to the spirit of man that nothing can stop. This is because "nor stony tower ... nor strong links of iron ... can be retentive to the strength of spirit" (Shakespeare, Julius Carsar, and Act 1: Scene 2).

While the document Why Osmosis observes the naturalness of Osmosis as a point of fact of the human nature and sees how / what man does to apply the process to human benefit, it observations are chiefly mechanical. Yet it observes that there is a built-in SMS Message Server that allows SMS messages to be sent from any telephone-type field on any screen. It mentions many more areas of importance of osmosis to man ; and even if much of these are mechanical (like the issue of the telephone just raised), that Osmosis relates with the cell phone bears a horrifying testimony to the validity of the contestation of the writer that must sleep with his telephones because of his belief in Osmosis.

This is also, the opinion of Adeleke and Leong(1978: 111),who noted that because the salinity of ocean waters vary, water of high salinity moves to areas of water of low salinity to ensure equilibrium, and vice versa. Although, also, Adeleke and Leong, were teaching not Biology, the view of these writers seem to tilt towards Osmosis being dual, that is, that there is Osmosis and Reverse Osmosis.

IWENA (2008 ,73) , in his view that ocean currents occur, owing to the differences in salinity (solute concentration) of ocean waters, admits that water must move from an area of lower salinity to that of higher salinity . ‘Where the salinity of an ocean water is high’, he wrote, ‘the ocean water creeps at the bottom of the ocean to lower salinity areas...where the salinity is low, the ocean water ...flow at the ocean surface towards a high salinity areas’. Although, definitely, IWENA had nothing like this theory mind, his idea witnesses this idea - things shall drift from an area of lower concentration to an area of higher concentration and vice versa. But since Duality reigns, there must arise a time when things will move at opposite direction.

The movement of water from the west coast of Africa to the land mass of south America , and from there to the north polar region is osmotic, while the return of this to the equatorial region could be termed ‘Reverse Osmosis’, through the Osmotic Gradient. Additionally witnessed in Osmosis Wikipedia, The Free Encyclopedia – Mozilla Firefox, the fact of water movement across boundaries is a fact not tearable; and also, that the new water in its new abode can have its influences there cannot be torn, either.

It is not only liquids that can accomplish osmotic feats: ideas can (St, Ifa in St. Ifa and Honsbira , (2009) . Also, the biblical teaching that because the earth was dark and blank , the spirit(s) of God and His co-creator(s) moved in from the upper heavens to glide over the surface of the earth , leading to the beginning of spiritual operations on earth (Gen 1 : 1 - 4) and the continual presence of God and Jesus where men are gathered in Divinity (Matt , 18 : 20) is reversely osmotic.

God’s Spirit and those of His co-creators moved in because more spirits were in the heavens than on the earth and because, also, the heavens itself was bigger than the earth. So, tracing the rule of Reverse Osmosis (RO) – how things move from where they are more to where they are less - the extra-terrestrials arrived the earth!

These reviews show that, following osmosis and its converse, reverse osmosis, learning can flow from the teacher to the student and vice versa.

DEFINITIONS OF TERMS

The key terms are Osmosis, Reverse Osmosis, Molecules, Membrane, Economy, weaker solution, stronger solution.

Osmosis is the process by which water molecules move from a place of higher concentration to that of lower concentration via a semi-permeable membrane (Nweze, 2004).IDODO-UMEH (2010: 73) says it “is the movement of water molecule from the region of lower solute concentration to the region of higher solute concentration through a semi-permeable membrane. UMEH, C.T. (1995) sees osmosis as such, too.

Reverse Osmosis is the movement of water molecules from an area of higher concentration to an area of lower concentration across a semi-permeable membrane. Reverse Osmosis is like diffusion, the tendency of a gas or liquid to mix with another and fill a less concentrated or empty space as a result of the constant motion of its molecules (Abbott, 1983:147, Okeke, 1995:10) because the molecules of matter are always in the state of constant motion with the molecules of gas being comparatively far apart (Okeke, 995).

Molecule is the smallest indivisible part of a substance capable of separate existence, “molecules being groups of atoms of various elements united in the same numerical proportion (Abbot, 1980). Now, what is teaching?

Teaching is a process in the profession called Teaching! Teaching is the process of imparting knowledge by a person supposedly better in that knowledge than another person, supposedly with lesser or no knowledge of the thing to be taught. It is teaching with results, not the teaching of the poor teacher (the poor teacher informs), the work of the average teacher (the average teacher tells), the work of the good teacher (the good teacher teaches), but the work of the excellent teacher (the excellent teacher inspires) (ifiedora, 1983).

Semi-permeable membrane is the region separating the two solutions concerned in the process of Osmosis or Reverse Osmosis (Why Osmosis?Http://Www.Sc-Sys.Com/Benefits.Html; IDODO-UMEH, 2010). In Biology, it could be cellophane, pig’s bladder etc.; in teaching, in this new science of teaching, it is the role of the teacher.

Economy in Economics means “advantage” (Fajana, et al, 2004; ANYAELE, 2003; Samuelson, 1977). But in this paper, it implies the length of time (in minutes) saved by the teacher in the application of a given teaching strategy compared with what could have been saved, teaching a given topic in a given class (and by the same teacher) through the orthodoxy.

When water moves from one half of an unripe pawpaw fruit into a bowl of salt or sugar solution, for example, the former is termed “weaker solution” while the latter is termed “stronger solution”. And when solvent leaves it solute into a solute-free solvent, the former is called “stronger solution” and the latter is called the “weaker solution”.

OBJECTIVES OF THE PAPER

By the end of this reading /hearing, the reader/hearer should be able to:

- i. Define osmosis (b) Molecule (c) Reverse Osmosis (d) permeable and impermeable membranes,(e) teaching,(f) Economy , (g) weak solution , (h) strong solution .
- ii. Relate teaching and osmosis as processes.
- iii. Relate Teaching-Learning and Reverse Osmosis as processes.
- iv. Teach any topic, prompted by the creed of Osmosis
- v. Dive into the realm of Science via the orthodoxy
- vi. Marry theory with practice
- vii. Marry Science and the Arts.
- viii. Point out legibly, the indispensability of Science in things.

PROBLEMS IN THE WAY OF THIS PAPER

- i. Many teachers are non-science teachers. They might find it hard to grasp the message of Osmosis/Diffusion and Reverse Osmosis in pure Arts like, History, Religion, and Literature and so on.
- ii. Books on pure Physics and Biology are not common among greater percentage of students, most of whom are Arts-inclined.
- iii. Many teachers are too lazy to travel with researchers along the lane of scientificity and empiricism which this discovery is all about.
- iv. Some in the extreme arts (CRS, History, and Social Studies etc.) deliberately refuse to see the need of pure empirical science in the pure Arts. The main explanation of this

could be found in disciplinary temperamental non-complimentarity, which, again, may be the result of the conservative attitudes of some professionals to the introduction of new methods.

SOLUTIONS TO THE PROBLEM OF APPLICATION OF REVERSE OSMOSIS IN TEACHING

- i. All teachers being trained, should be able to read the basic sciences to, at least, their late pre-examination days.
- ii. Libraries should be well-equipped with Science books even in Arts school.
- iii. Teachers should develop the urge for, and the spirit of, empiricism for modernism.
- iv. Inter-disciplinary researches should be encouraged among teachers by Government.

RELATING OSMOSIS AND REVERSE OSMOSIS TO/WITH TEACHING

This section provides us excuses for dealing with specifics as it is the inter-specifics contained in the issue of osmosis and Reverse Osmosis and teaching-learning as processes that are the views in view.

If Reverse Osmosis is the movement of water molecules from a region of higher concentration to a region of lower concentration and teaching-learning is the process by which knowledge flows from a person of higher knowledge to a person or persons of lower knowledge, then the two processes can be compared for benefits. If the water move in osmosis is due to the fact of there being an osmotic Gradient between the two liquids, that is, difference in concentration between the two liquids, teaching-learning process can also be deemed to be due to the fact of there being a major difference between the teacher and the taught. We can call this “Knowledge difference” or “knowledge gradient”, following our theory.

The Semi-permeable membrane of the osmotic process is the difference in knowledge or learning between the teacher and the taught in the teaching process. As molecules are always in state of constant motion (Abbot, 1995; Okeke, 1990), the knowledge possessed by both the teacher and the taught are in a state of constant motion – if not so, *no impromptu answers would get to impromptu questions!*

The strong solution in Reverse Osmosis is the teacher in the Teaching-Learning Process. The molecule of the strong solution is compensated for by the topic which the teacher teaches. The weaker solution in the osmotic process is the student in the teaching-learning process – or his lesser knowledge.

To effect Reverse Osmosis, the following are conditions:

- i. Osmotic Pressure
- ii. Externally-applied Pressure, in excess of the osmotic pressure
- iii. Osmotic Gradient, pressure differential etc.

USING THE TENETS OF REVERSE OSMOSIS TO TEACH IN THE CLASS

Arising from the above, we can understand how teaching-learning process is relatable to Reverse Osmosis, and its implications, as a matter of fact of the effectiveness of teaching, is not difficult to see. To begin with, the teacher must:

- i. Assume the whole arms of a given class as one - mix up all the arms - A, B, C, D etc as one.
- ii. Give them a prognostic test to ascertain their potential entry behaviours. Position them first, second, to the last, say 120th.
- iii. Re-divide them into groups of 30, 40, etc as convenient like these.

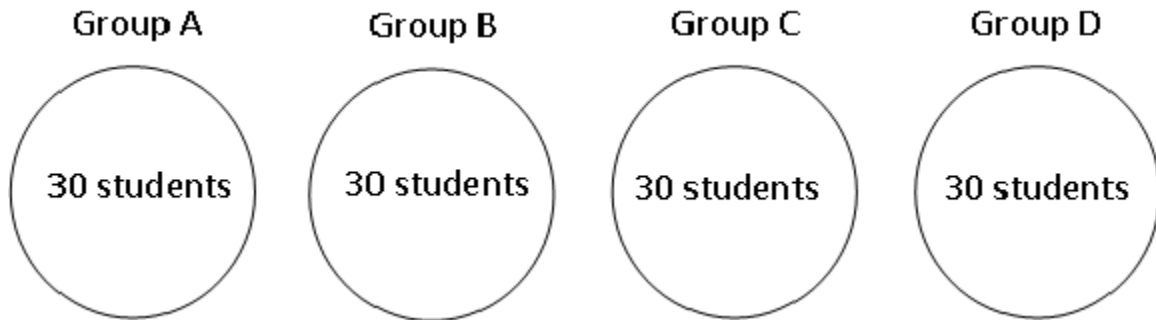


Figure 1: Grouping Students for Osmotic teaching

- iv. Let group A contain the student of 1st position, B, the second position student, C the 3rd position student and D, the 4th position. The group, A, instead of carrying the 5th student, should have the 8th position student; B, should have the 7th position student; C, 6th position; and D, the 5th position student. Now start the process by putting 9th position student in A ... to the end. This is to ensure equability in the distribution of the various IQ's of the whole class.
- v. Identify a space in the school playground, divide this with curtains into four space, the curtains being as transparent as possible. Place seats in each of the spaces according to the number of students in each group. The teacher stands at the front of one end of the curtain like this.

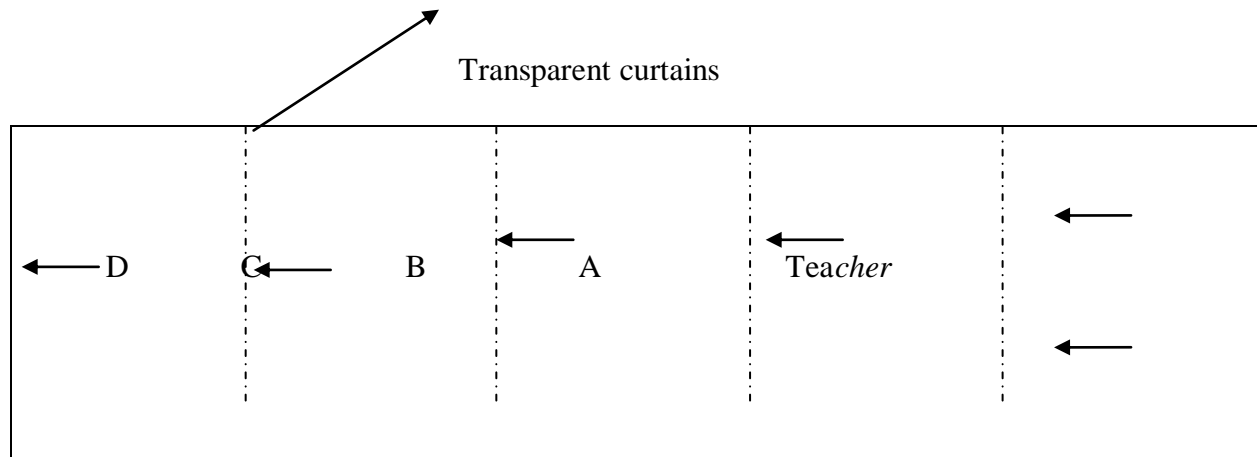


Figure 2: Using Curtains to Divide the Class

- vi. The teacher starts teaching, facing the curtain near to him without necessarily contacting it. He starts with appropriate introduction, " I have started", for example. The teacher teaches the topic from start to finish, accepting few questions. He repeats the teaching process once more, allowing fewer questions.
- vii. He pick out a student in group A by random sampling (picking folded papers, foreexample) to face the curtain next to him and start teaching.

He starts by announcing: ‘I have started’, following the teacher. He/she teaches and entertains questions from his group as well.

- viii. The turn gets to group B and then to C.
- ix. D teaches the teacher, who feigns being of lower knowledge, and asking questions in that capacity! The teacher plays this role by appearing, thinking and acting like the child. The wisdom in, and the validity of, this technique can be found in the teaching of Jesus that to be able to interact with the little children, with the view to getting to heaven with them, it is necessary to act like the little child outside heaven (Matt,18, 3-4; 19 : 13-14). And the Haiku of Honsbira (2011) that

Children are simple;

Lean and learn to be like them;

Christ is example.

bears an excellent witness to this philosophical fact.

- x. The teacher, then, evaluates by asking each group some four to five short questions like these:

Group A:

- a) Define the jihad
- b) Who was the leader of the jihad?
- c) Where did his ancestors come from?
- d) When?
- e) Name one king in Hausa land at the eve of the Sokoto jihad

Group B:

- a) When we saying “jihad”, what do we mean?
- b) Name the Hausa ruler that hated Dan Fodio most.
- c) “Dan Fodio was an itinerant teacher”. Name one person he taught.
- d) Give the exact date when the jihad started.
- e) Give one cause of the jihad

Group C:

- a) List 2 causes of the Sokoto jihad
- b) Name one place where Dan Fodio taught.
- c) Where was the battle field of the Sokoto jihad?
- d) Was there any Hausa on the side of Dan Fodio?
- e) What group of people fought the jihad? (a)Hausa (b)Fulani (c) Arabs (d) kanawas.

Group D:

- a) Name one important person in the jihad other than Dan Fodio
- b) By what date did Hausa land came under the Fulani government?
- c) To what religious denomination did the jihadist belong?
- d) What is Hejira?
- e) What religion was in Hausa land at the eve of the jihad?

The result of this test shows the extent of success, or otherwise, of the lesson. The teacher finally determines this by adding the scores of the four groups and working out the cumulative average. Assuming the averages is:

A	B	C	D
60%	80%	90%	80%

$$\begin{aligned} \text{The cumulative average} &= (60+80+90+80) \% \text{ divided by } 4 \\ &= 310/4=77.5 \% \end{aligned}$$

This shows the Reverse osmotic method of teaching worked!

Workability of the Application of Reverse Osmosis in Teaching

The workability of the reverse osmotic process in teaching is based on

- i. Osmotic gradient between the two solutions (concentration difference), compensated for in the teaching process by the fact that there is a knowledge difference between the teacher and the students A, which difference is transferred to each group and the succeeding ones in the applicative process.
- ii. In Reverse Osmosis, there must be an externally-applied pressure; in the reverse osmotic method of teaching, there is an externally-generated pressure by way of the almighty directive of the teacher.
- iii. The Reverse Osmosis is an innovation on the traditional /natural osmosis; its application in teaching is an innovation on the traditional Discussion Method of teaching History and kindred subjects.
- iv. Where the conditions necessary for osmosis are present, osmosis must occur; where teacher and students are gathered, and teacher and students are ready for the teaching-learning process, knowledge must flow from the teacher into the students.
- v. Teacher must ensure the time taken in teaching the four arms/classes does not exceed the time allotted the topic, using the orthodox method.

CONCLUSION

The teacher has stood in place of the concentrated solution. The curtain between him and group B is the semi-permeable membrane (Umeh, 2010:642). The group, B in turn, becomes the concentrated entity, while C is the less concentrated solution with the curtain, in between, as the semi-permeable membrane. Drawing in content from A (which received from the teacher) ,B becomes concentrated and through the curtain between it and C, donates “taught” (molecules) to C, which takes in “taught” (called “know”) which , in turn, it gives to D . D finally gives to the teacher, *trans-psychologised*. By Transpsychologisation, is meant the process by which a person changes the shape and state of his/her mind to resemble that of a different group or age of people in order to achieve a purpose.

The result of these is better teaching-learning process. It improves the child, it improves the world.

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