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Prompting Learners' Active Participation in an EFL Class

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Received: 11 June 2015 Accepted: 1 July 2015 Published: 15 July 2015

Abstract

This paper seeks to explore the dynamic relationships between cognitive, affective, and psychomotor components of EFL learners in the classroom, to work out solutions to the problems encountered by those reticent learners. This paper also attempts to describe the underlying dynamic of the three components by borrowing the ideas from physics and mathematics such as Newton?s three laws along with important concepts from vector calculus (? - del, ?? f ,?× f) in order to determine the relative rates (gradient), level of diversity, and level of curl among the three components. The description on the basis of threedimensional coordinates helps clarify the complexity involved in the types of reticent EFL learners, each of which features unique combinations of the three components, and specific instructional approaches of different orientations (cognitive, affective, and behavioral, or combined) are suggested such as Jigsaw, Vygotsky?s social-constructive, content-based, taskbased, competence-based, and operant conditioning, and the like, to deal with EFL reticent learners of different types. The model presented in this paper ushers more empirical studies on relevant issues in EFL instruction.

Index terms— types of reticent EFL learners, each of which features unique combinations of the three components, and specific instructional approaches.

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1 GJHSS-G Classification : FOR Code: 930101

2 PromptingLearnersActiveParticipationinanEFLClass

3 Strictly as per the compliance and regulations of:

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4 I.

Reticence in efl Participation eticence, or passive participation in an EFL classroom, has long been a common phenomenon and has received growing attention in recent years **??**Burgoon, J., & Koper, R,1984; **??**ou, 2004). While some EFL learners have been used to being listeners in learning other subjects (e.g., math, physics, history, and what not), these EFL learners are still reticent in language classrooms (especially for speaking and listening related subjects) where active participation and interaction are essential. Reasons behind such a reticence can be: fear of losing face, low proficiency in the target language, previous negative experiences with speaking in class, cultural beliefs about appropriate behavior in classroom contexts, incomprehensible input, habits, lack of confidence, and personality **??**Zou, 2004;Miller & Aldred, 2000). Among these reasons, passive habits can be significant in that other factors such as low proficiency, incomprehensible input can be neutralized by posing questions for clarification (active participation), while personality factors (such as introversion) or lack of confidence is a matter of quantity of response, which may have little to do with reticence, and is not the focus of what the English instructors are concerned **??**Liu & Jackson, 2007).

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5 Student

teachers' perceptions about communicative language teaching methods. RELC Journal, 31(1), 1-22.

This paper thus seeks to explore the phenomenon behind reticence (mainly on habit formation) through a mathematical model, and suggests solutions to the problem. In what follows, Newtonian's laws will be adopted as a ground rationale, followed by the application of existing learning theories (such as Vygotsky's constructivism, and Skinner's operant conditioning, Bloom's learning objectives) on the bases of the operations of partial derivatives in mathematics.

6 II.

Reticence as a Function of Inertia Students' reticence in an EFL classroom can best be analogized as a state of inertia, which is the first law in the framework of Newtonian's classical mechanics. That is, the velocity of a body remains constant unless the body is acted upon by an external force. By analogy, every student, as well as the teacher, persists in his state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by force impressed. In the EFL classroom settings, reticent students will remain reticent until a positive force (impact) is received, whereas the active student will remain active until a negative force acts on him. Mathematically stated:0 0 = ? = ? dt dv F (01)

(F -the total extra force that acts on the individual, dv-the derivative of velocity, and dt -derivative of time (acceleration). This tendency of objects in nature to want to remain in the same state and to resist any changes unless the object is forced to do so is called the inertial property. The inertial property then is the resistance to change; the object will not change unless it is forced to or somehow motivated by attractive or repulsive effects to change (Dean Hamden, 2009). How much attractive or repulsive force is needed to cause effects to change is another issue, which has to do with the second Newtonian law. Hence the second law: The acceleration of a body is parallel and directly proportional to the net force F and inversely proportional to the mass m, i.e., F = ma. The mass can be taken outside the differentiation operator by the constant factor rule in differentiation. Thus, ma dtdv m F = = (02)

(where F is the net force applied, m is the mass of the body, and a is the body's acceleration.) Thus, the net force applied to a body produces a proportional acceleration. In other words, if a body is accelerating, then there is a force on it. By analogy, students' performance in class, either active or passive (as reticent), can be the function of their strength of inertia.

Here duration of inertia can be one of the estimators of the strength of inertia; thus the longer the duration of inertia, the stronger it is. Therefore, the minimum amount of attractive or repulsive force to counteract or change original inertia must be greater than F. The acceleration, a, also be seen as F divided by m. Thus, the more F is, the more a, and the more m, the less a, when F is fixed. By analogy, if a student's being reticent in class has become a trait (long duration of inertia, thus large m), then the instructor will have to exert F, strong enough to counteract m, to create any desired effect a, (i.e., toward being more active). It is worthy of note that F can be both the attractive and repulsive force, with the former moving students toward being active in class, while the latter toward being even more reticent on the part of students. Yet, the teacher can also respond differently after exerting F onto learners, depending on the effects of the F. If F is the attractive by nature, then the teacher will also receive such a force (as encouragement or reinforcement for next moves), and vice versa, which can also be suggested by the third Newtonian law.

As the Third law indicates: The mutual forces of action and reaction between two bodies are equal, opposite and collinear. That is, to every action there is always opposed an equal reaction: or the mutual actions of two bodies upon each other are always equal, and directed to contrary parts. Specifically, whenever a first body (the teacher) exerts a force F on a second body (the student), the second body (student) exerts a force ?F on the first body (teacher). F and ?F are equal in magnitude and opposite in direction. This law is sometimes referred to as the action-reaction law, with F called the "action" and ?F the "reaction". The ac tion and the reaction are simultaneous. Note also that though the forces are equal, the accelerations are not: the less massive body (e.g., student) will have a greater acceleration due to Newton's second law. The third law can be stated mathematically as follows:? ? ? = F F b a b a , ,**(03)**

(Where Fa, b are the forces from B acting on A, and Fb, a are the forces from A acting on B.)

The variables F, m, and a, in Newtonian laws can be very complicated, each of which has manifolds.

F and m are the cumulative forces from instructions inclusive of teaching/learning methods, material inputs/output, activities, tests, teaching/learning styles, teaching/learning objectives, and the like, whereas can be a dependent measure of the ratio between F and m. The multidimensional nature of the instructional settings can best be mathematically reflected through the concepts of partial derivative, integrative, and matrix. In the following the relationships among the three main educational objectives as initiated by Bloom's taxonomy will be interpreted mathematically.

7 a) Bloom's taxonomy

Benjamin **??**loom (1956) Organizing and Conceptualizing, characterizing by value or value concept. Students will have to display their willingness to learn by receiving, before they can do the responding, and then learning can gradually become part of students' value system on the basis of value organization and conceptualization. Lastly, the psycho-motor domain also manifests subcategories from imitation, manipulation, precision, articulation, to naturalization (Dave, 1975). Theoretically, dynamic relationships exist at least in the three domains, and in the sub-category of each domain. There is mutual interdependence among these three domains. In other words, instruction or learning as a whole must include these three components to be effective and meaningful; success in one component must be supported by success in the other two components but with different proportions. In the following, the possible combinations in terms of success (desirable: +) and failure (undesirable: -) in each of the three domains (cognitive, affective, and psycho-motor) will be described to reflect "reticence' mathematically, followed by more complex mathematical operations on the interrelationships of these three components.

8 Partial Derivatives of the Three Components

If the three components (cognitive, affective, psychomotor) can be given a positive value [+], or a negative [-], each of which represents a desirable or undesirable state, respectively. For example, the values [+, +, -] represents the situation when learners' cognitive state is positive (desirable), affective positive (desirable), whereas psychomotor negative (undesirable). Then, all the possible combinations can be listed as: Among the above 8 Cases, EFL learners under Cases 2, 4, 5, 8 can be categorized as reticent in that their psycho-motor aspects (oral performance) are not desirable. However, what can EFL instructors do to improve the situations? As indicated from the negative value sign (-), EFL learners under Case 2 must receive instructions that focus on psycho-motor aspect, focus on both affective and psychomotor aspects under Case 4, focus on both cognitive and psychomotor under Case 6, and lastly, focus on all the components (cognitive, affective, psychomotor) under Case 8. Since these three components make up the learning status with each one independent of the others, it is convenient to conceive them as a vector with three different coordinates. Their interrelationships can be further elaborated through the operations of vector calculus and vector integrals. Such an attempt is to further explore the relative strength of the three components in terms of different proportion of rate of change, which helps provide a guideline for instructors to give the optimal instruction that is based on the principle of 'equilibrium' among the three components.

In general the states of the three components in a given situation can be specified as **??**Holzner, Steven, 2005): In order to explore more of each of the components along with their relative values, we will adopt some useful operations such as:? ? ? ? ? ? ? ? motor F aff F cog F , ,**(04)**? (del), F ? , , F ? ?

? × F and so on. First of all, we will illustrate the rate of change of each component in terms of the mathematical symbol as:= ?F ? cog F ? ? , aff F ? ? , motor F ? ? ? (05)

An important example of a function of several variables is the case of a scalar-valued function f(x 1 ,...x n) on a domain in Euclidean space R n (e.g., on R 2 or R 3). In this case f has a partial derivative ?f/?x j with respect to each variable x j . At the point a, these partial derivatives define the vector? ? ? ? ? ? ? ? = ?) ( ),... (2), (1) (a xn a x a x a f (06)

This vector is called the gradient of f at a. If f is differentiable at every point in some domain, then the gradient is a vector-valued function ?f which takes the point a to the vector ?f(a). Consequently, the gradient produces a vector field.

This expression also shows that the computation of partial derivatives reduces to the computation of one-variable derivatives.k x j x i x ? ? ? ? ? ? ? ? + ? ? ? ? ? ? ? ? ? + ? ? ? ? ? ? ? ? ? = ? (07)

It is also important to know just when changes (level of curl) in any of the three components (cognitive, affective, and psycho-motor) will occur. Since these three components are interdependent, with triad relationships, changes in one component are subject to the relative strength of the other two components. For example, changes of cognitive component (from desirable to undesirable) depend on the relative strength of the other two components (affective and psycho-motor). In vector calculus, [

9 F $\times$?

], referring to the level of curl, can offer good reference for understanding componential changes in F. Let's assume the three coordinates x, y, and z, as denoted below: In the same vein, in the case of Phase 4 (as indicated in Figure **??**), where learners show negative sign on both cognitive and psycho-motor aspects, things become easier in that y Fx x Fy yFx xFy z F ? ? ? ? ? ? = ? ? ? = ? $\times$?? (08) z Fy y Fz zFy yFz x F ? ? ? ? ? ? = ? ? ? = ? $\times$?? (09) x Fz z Fx xFz zFx y F ? ? ? ? ? ? = ? ? ? = ? $\times$??

10 Conclusion

Borrowing the ideas from other fields of discipline has a lot of advantages, especially when dealing with two totally different fields such as physics and psychology or even language instruction, though this may also usher a lot of disputes and criticism. In this paper, attempts have been made to integrate the laws in physics with the problems in a foreign language classroom. Undeniably, there are intrinsic differences between the laws in physics such as gradient, diversion, and curl and those found in educational psychology or instructional psychology, and direct borrowing them and mixing them may always go wrong. However, in the present paper, ideas from physics have been ruminated and checked whether they also fit into the framework of instructional psychology. Two instant benefits can be found by doing so. First, in the field of instructional psychology, the approaches adopted are often vague in terms of empirical studies, the ideas in physics based on objective calculation in the forms of equations, which clearly indicate the relationship among the variables, are more specific and objective, thus enhancing the validity and reliability of instructional relevant fields. Second, if the suggestions from the application of ideas from physics are not robust enough after further experimental verification, then at least we learn what may or may not have effect, but what if there is more insights coming from the process of integration. Innovation is required in the field of instruction. The suggestions for the solving problems of reticence in language classrooms are, in every sense, tentative, and worthy of further empirical validation. [1]

Figure 1:

Figure 2:

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