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INTEGRATING ISSUE ON THE LANGUAGE AND MATH CONCEPTS INTO THE TRAINING SYSTEM (SAMPLES BASED ON THE MATH SET AND ENGLISH LANGUAGE ACTIVE OR PASSIVE PATTERNS)

Abstract: The article proposes learning language and mathematics are the similar intellectual acts. These cognitive learning processes takes place in interactions. It explains knowledge as emerging from as the network connections that bind and complete each other, in other words, a system of complex connections that uniteand relate one another. Therefore, learning networks within networks, in the learning process. This paper work exampled on the concept of English active and passive patterns that is explained in the mathematical set. This evidence created and mentioned as the teaching approach which is based on the integration of the sciences into the modernization of today's education in Mongolia. Especially it is a new generation (the z and alpha ages) of human development to participate in the international intellectual labor market, to study and to compete, to make an important contribution to raising and sharing the intellectual capital of the Mongolian people. To create it, the transformation of knowledge management of any logic at every level of recognition that opens the way for more intellectual capital of teachers and students to cultivate.

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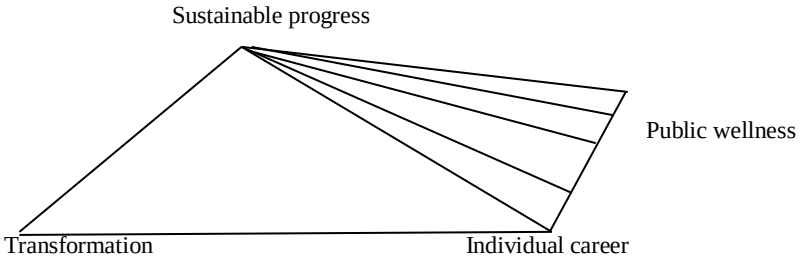
I. Introduction

In the global spread of knowledge today, it is required that a graduator of the university, who equipped high intellectually in the mindset, regardless of his or her specialty, incorporates how to recognize various kinds of reasoning as the application of rules or the sets and subsets, modeling abstract phenomena, modeling natural and economic phenomena, and methods of scientific research. Therefore, it is important for universities and colleges to establish a foundation for new areas of life longitudinal learning that allow them to transform and provide knowledge.

The architecture of knowledge in the 21st century



(…) An individual skills of innovating leads to an different career, everybody wants a representation to have. This basis of such human innovation capacity is the nonlinear knowledge of the interdisciplinary sciences.

One of the important orientations in improving the management of universities by training specialists in a knowledge-based society is creating a non-linear knowledge through transmitting of knowledge management. *(Chuluundorj.B, 2004, pp. 4-7)*

The cognitive science is interdisciplinary, so this paper aims to conceptualize the language and mathematics are associated in the intersection of the sciences. The evidence provides how to transform mathematic knowledge to English language. Consequently, the modern language teaching must integrate the mathematical logics. Mathematical formulas expand the mindset of the human. Therefore, the contemporary teachers need to seek creative methodology in pedagogical learning system that is progressed on knowledge management.

This paper falls into 5 sections: section 1 and 2 introduce the studies on this issue, section 3 describes the methodology applied in this paper, section 4 is partly related to the prior section and shows specification of my evidence association on English language and math sciences (which is in samples English active and passive tenses with mathematical set theory), section 5 describes the result, eventually section 6 sums up coherently major findings of the paper.

II. Literature review:

(…) Herbert Alexander Simon was one of the first to study the issue of problem solving through creative thinking. For this author discovering is something rare. There are no differences between the resolution of our daily problems of our day to day or problems of scientific order in a research setting. Innovation has no secrets, it occurs through simple elements experienced in our reality "the secret of innovation is that there is no secret. It is accomplished by making complex combinations of simple elements play"

Knowledge is accomplished through discoveries of theoretical processes of cognitive science which permits the human being to discover through perception, or cognition a way to explain the world in the best possible way, in other words, the representation of the world around him the most accurately possible.

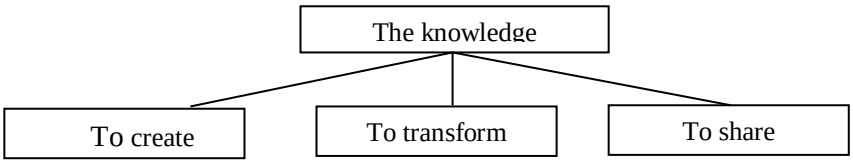
In this approach knowledge is conceptualized as a grouping of world representations, formed by a number of circumstances which compose our daily lives. Therefore the knowledge is the result of our sensory experiences, an explanation / representation of the reality that surrounds us. *(Paulo, 2016)*

(…) In recent years the profession of teaching has reached a maturity to the point of being considered a producer of own knowledge necessary to the practice. The teacher is no longer seen as a technician, but as an intellectual actor and the specialized literature advocates teaching as a profession, and it recognizes that the teacher has "knowledge base", a set of skills that are developed during his teaching activity. The Pedagogical Content Knowledge (PCK) is a concept that seeks to represent the teachers' professional knowledge.
In this pedagogical content knowledge we need contain knowledge management (KM). The core goal of knowledge management is to connect "knowledge nodes" - those with knowledge and those seeking knowledge - to ultimately increase the knowledge within an organization. Within that goal, the authors identify four objectives of KM: to capture knowledge, to increase knowledge access, to enhance the knowledge environment, and to manage knowledge as an asset. *(Fernandez, 2014)*

The knowledge-based economy, new technologies, the growing speed of technological changes and globalization all influence the needs to improve the population's skills and competences. In Europe, this has been acknowledged for several years (Colardyn, D. & Bjornavold, J., 2004)
Hence, knowledge management makes "Life long learning" (LLL). It is the continuous building of skills and knowledge throughout the life of an individual. It not only enhances social inclusion, active citizenship and personal development, but also competitiveness and employability (Wikipedia, LLL, 2011). The term lifelong, as applied to education or learning, has been in circulation for more than a quarter of a century (Friesen, N. & Anderson, T., 2004). LLL, it is asserted, requires that learning outcomes from different settings and contexts can be linked together.

(…) Knowledge management is not only the ability to adapt to new information and information technology environments in a rapidly changing environment, but also the ability to adapt to new situations as a basis for synergistic combination and creative innovation.
Knowledge management is the management of knowledge creation, acquisition, distribution and use, which includes the collection, analysis and processing of knowledge into knowledge and the coding of knowledge.

Creating the knowledge and using process



The forms of the creating and transforming the knowledge

The process of using knowledge	Making converse in knowledge	Creating knowledge
Emerge new knowledge	Creating the concept	Solving the problem
Using new knowledge	Elaborate the concept	To integrate
Expressing new knowledge	Describe hierarchical knowledge	Long term living knowledge

(Chuluundorj.B, 2004, p. 12)

(…) Knowledge Management in Education that makes eminent sense—a wonderful combination of good intuition, practical know-how, and a feel for what might be best described as a set of emerging theories focusing on the effective management of knowledge in educational institutions. In part, what the authors give us is a language for becoming more adept at the management of knowledge in our lives as both teachers and scholars. And in part, what we are offered is a set of simple schematics for linking people, processes, and technologies—for understanding "that people, not systems, manage knowledge." The authors help us to understand how organizations can promote policies and practices that help people share and manage knowledge. By putting intuition into practice, knowledge management builds upon collegial and professional teamwork by actively engaging people in sharing with others what they know and what they are learning. Finally, Knowledge Management in Education reminds us that education is truly a seamless endeavor. Much of what the authors have learned derives from both primary and secondary education as well as from higher education. What their monograph demonstrates is just how useful and feasible it is to apply knowledge management practices to both K–12 and collegiate environments. *(Nodine, 2003).*

III. **Methodology:** In this research is used methods of qualitative, mathematical logic, analysis and synthesis, comparison

IV part
Evidence on the integration using mathematical set that for transformation of English active voice to English passive voice

Observation evidence 1
The **active voice** describes a sentence where the subject performs the action stated by the **verb**. It follows a clear subject + **verb** + object construct that's easy to read. In fact, sentences constructed in the **active voice** add impact to your writing. With **passive voice**, the subject is acted upon by the **verb**. As a notion, the structure of the English active voice is SVO. Therefore, the structure of the passive voice is OVS.
S – Nominative case or Subject

V-Verb or predicate
O –Object
We can observe “the subject” in the active pattern transforms to “the object” in passive pattern. So let the elements “the subject” and “the object” of a set of these construct SVO or SOV be the set of variables in the active and passive patterns.

If PP (personal pronoun) is the set of the subset personal pronouns in the active pattern:

PP={I, We, You, He, She, They}

If OP (object pronoun) is the set of the subset object pronouns that describe the objects in the passive pattern:
B= {me, us, him, her, them}

PP ∩ OP = {pronouns} Because this pronoun is the only pronoun in both intersection of the sets PP and OP.

/Table -1/

I	We	You	He	She	They	me	us	you	him	her	them	Noun
a^1	a^2	a^3	a^4	a^5	a^6	a^{-1}	a^{-2}	a^{-3}	a^{-4}	a^{-5}	a^{-6}	a^0=e

In the /table-1/ personal pronoun “I” matches the object pronoun “me”, personal pronoun “we” matches the object pronoun “us” etc. In similar words, the personal pronouns match object pronouns regarding to the algebraic formula $a^1 * a^{-1} = e$. This equation is solved algebraically that the variable “I” in the active pattern similar on the object “me” in the passive pattern.

Observation evidence 2
If /Y_i/ is the set of the verbs in the present, past, future tenses with the active and passive patterns, and if /Y_{ij}/ is the present, past and future tenses with four aspects: the simple, progressive, perfect and perfect progressive Y1 = $\{v_{11}, v_{12}, v_{13}, v_{14}, v_{21}, v_{22}, v_{23}, v_{24}, v_{31}, v_{32}, v_{33}, v_{34}\}$

Y2 = $\{v_{11}^{-1}, v_{12}^{-1}, , v_{13}^{-1}, v_{14}^{-1}, v_{21}^{-1}, v_{22}^{-1}, v_{23}^{-1}, v_{24}^{-1}, v_{31}^{-1}, v_{32}^{-1}, v_{33}^{-1}, v_{34}^{-1}, \}$

This union of the sets appears in the below table:

/Table -2/

Subset union of the Y1 set	**Aspects of the active tenses (simple, progressive, perfect and perfect progressive)**	**Subset union of the Y2 set**	**Aspects of the passive tenses (simple, progressive, perfect and perfect progressive)**
V_{11}	write	v_{11}^{-1}	written
V_{12}	am, is, are writing	v_{12}^{-1}	being written
V_{13}	have, has written	v_{13}^{-1}	been written
V_{14}	have been, has been written	v_{14}^{-1}	.....
V_{21}	wrote	v_{21}^{-1}	written
V_{22}	was, were writing	v_{22}^{-1}	being written
V_{23}	had written	v_{23}^{-1}	been written
V_{24}	had been written	v_{24}^{-1}	.....

V_{31}	shall, will write	v_{31}^{-1}	be written
V_{32}	shall be, will be going	v_{32}^{-1}	.....
V_{33}	shall have, will have written	v_{33}^{-1}	have been written
V_{34}	shall have been, will have been written	v_{34}^{-1},	.....

In algebraic formula the construct of the English sentence is: a= (S) (V)► (O)►

Thus: The professor wrote the paper.

This sentence can transform into the passive pattern: The paper written by the professor.

Above transformation describes into the inverse function: $f(a^i) = (a^i)^{-1}$ and depends on the a^i .

Likewise, g function of the verbs (v_{ij}) is attributes in the inverse function. It describes: $g(v_{ij}) = (v_{ij})^{-1}$

Here empty sheets in Table-2 describes in the set theory:

K (g) = { (v_{ij}) : g (v_{ij}) = 0 }={$v_{14}, v_{24}, v_{32}, v_{34}$} This k set depends on the g . It expresses

K (g) = { $(v_{ij})^{-1}$ = 0 }={$v_{14}, v_{24}, v_{32}, v_{34}$} гэсэн үг юм.

In this consequence is created the evidence:

$SVO = (OVS)^{-1}$

$OVS = (SVO)^{-1}$ These 2 inverse expressions makes: SVO*OVS=e . It means these expressions are equal to 1. Let us have evidence this expression:

$a^{-n} = \frac{1}{a^n}$

$SVO*OVS = SVO*(SVO)^{-1} = SVO * \frac{1}{SVO} = 1$

In the sample of the sentence:

The professor has written the paper. /the construct of the SVO/
The paper has been written by the professor. / the construct of the OVS/

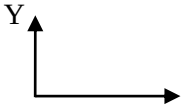
Above 2 sentences are expressed one meaning in two another structure.

These evidences are analyzed following:

The action of the mind as a language is the act of thinking as well as mathematics. Therefore, language and mathematics are directly related in our mind.

Mind of mathematics ⟷ Mind of language

On the other hand, if we look at mathematics as X and language as Y, it is a function that has the relation between sets that associates to each other.



X

The process of language acquisition can be interpreted as y = f(x), and is a function of the interdependence of language proficiency depending on the level of mathematical knowledge. This experiment is focused on how the mathematical function creates integration as math and as language in the investigation. This function formula provides the teachers must acquire "knowledge management" and to transform their knowledge to the experiments of teaching. This process is expressed by the function formula that the teacher and the student are depended each other how they can transform. This relation creates the function y=f(x) in which
the transformation skill - f,
the teacher's knowledge management - x,
the student's knowledge management - y. This function formula is provided not only is knowledge limited by the integration of functions and numbers, but also the integration and interdependence between other sciences is the basis of existence and sustainable development.

V. Conclusion

1. We can acquire and connect as scientific knowledge learning consciously in the integration. Though, this evidence investigates especially, the second language acquisition and mathematical acquisition associates in our mindset. Because of this reason, contemporary teaching approach must include knowledge management that implements it hierarchically and systematically in education level. If that mainstream of teaching second language acquisition will be able to aim to identify the neural mechanisms and circuits responsible for the same observable behaviors.
2. There is a need to improve system-level management in order to emerge and construct a knowledge-based society. Especially, this fundamental base begins from recognition system in the pre-school education. In this beginning acquiring process the behaviors and stakeholders must pioneer scientific integrated approach and method of teaching still long lasting living process. The basis for the ability of a person to learn and live not only during his school years but also throughout his life is the integration of science and knowledge.
3. Ultimately, knowledge management is an integrated system of accumulating, storing, and sharing knowledge within a team or organization. So current teachers must seek and transform knowledge management components, as well as strategies of teaching to implement it successfully regarding to modern Z and A (alpha) ages recognition and intellectual capacity.
4. High-level capital is of great value, and so there is a goal of owning and selling intellectual capital at a convertible level. At all levels, human capital and human development are one of the key factors in economic and social development, and it is important to truly evaluate the current level and focus on human development.

I hope that the analysis and recommendations in this paper work will launch further debate and prompt practical steps to help school systems, colleges, and universities improve their efficiency, enhance their decision-making capacity, and ultimately increase their overall effectiveness.

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