LEARNING ANALYTICS MODEL TO IMPROVE THE COGNITIVE ABILITY AND PRAGMATICS SKILLS OF THE LIMITED PROFICIENCY LEARNERS

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Abstract

This article focuses on interdisciplinary research of English language and Psychology in proposing a learning analytics model to improve the limited proficiency learner's cognitive ability and pragmatic skills. Pragmatics helps the learners to understand and explore conversational implicature and how meaning is constructed in interaction, to interpret the meanings of language from a broader intercultural aspect, and to be more sensitive to people's intentional meanings embedded in international interaction. The contemporary theories, when reviewed highlight training students in acquiring Pragmatics and Cognition separately. Since the limited proficiency learner's problem in communication is failing to understand the speaker's intention, the researcher was prompted to develop a model to improve their cognitive and pragmatic skills by including various theories such as components of Pragmatics, Information Processing Theory, Multiple Intelligence, Bloom's Taxonomy and Learning strategies. The proposed model comprises six components of pragmatics namely Speech acts, Sociocultural competence, Transactional competence, Strategic Competence, Discourse competence and Interactional competence and in order to make acquired learning stored up in the long term memory, the Information Processing Theory is followed. The learners' senses are stimulated by Multiple Intelligence through various activities while seeking out for information. According to Bloom's Taxonomy the pragmatics components are divided into lower and higher order thinking skills and the learning strategies which unites the lower order and higher order thinking skills are Cognitive strategies and Metacognitve strategies. The initial phase of developing the learning analytics model is the identification of the limited proficiency learner, from the sample size of 40 first year undergraduate students from the department of English and 40 first year undergraduate students from the department of Social Sciences, Lady Doak College, Madurai. Along with the academic performance of the first semester, the Cognitive Linguistic Quick Test (CLQT), Cognitive Status Exam (BCSE), Speed and Capacity of Language Processing Test (SCOLP), Well Being Evaluation Scale (WES) tests are conducted in the psychology lab to gauge their cognition and communication level. Thus a learning analytics model on Cognitive Pragmatics is proposed to improve the cognitive and pragmatic skills, based on the needs of the learner's cognition and communication skills.

Keywords: *Pragmatics, Cognition, Information Processing Theory, Learning Strategies, Multiple intelligence and Cognition and Communication assessment tools.*

Introduction

Noam Chomsky's assertion that language is a specialized or modular faculty is still a debatable one for the linguists as well the language researchers. Based on the assumption of Chomsky the language researcher, has gradually yielded to evidence that language processing is cognitive processing of language information and that language learning is continuous with the learning of other sorts of information, such as gestures or sound patterns. Thus, understanding the learner's capacity for language means understanding the development and recruitment of general learning and cognitive processes. From this, evolves the discipline Cognitive Pragmatics, the study of the mental states of people who are engaged in communication. According to Bara Bruno, "the analysis of communicative interactions on mental states means, first and foremost, examining individual motivations, beliefs, goals, desires, and intentions and then to examine how these states are expressed. The analysis of the mental processes of human communication is based on three fundamental concepts: cooperation, sharedness, and communicative intention. All of the three were originally proposed by Grice in 1975, though each has since been refined by other scholars." Information-processing theory, one of the dominant cognitive theories since 1970, attempts to describe how sensory input is perceived, transformed, reduced, elaborated, stored, retrieved and used. In terms of information processing model, learning represents the process of gathering information, and organizing it into mental schemata (organized structures of stereotypic knowledge). Learning is defined as the process of acquiring new information; while memory is defined as the persistence of learning that can be accessed at a later time. When learning creates ripples in the minds of the learner it leaves an indelible mark. Thus, this article is an attempt to build a model to retain the gathered information and acquired skill of the learners fully and make learning an effective and an everlasting one. The next section reviews articles in journals to get a better perspective in framing a Learning Analytics Model on Cognitive Pragmatics (LAMCOP) to acquire the cognition and pragmatic skills of the limited proficiency learners of the undergraduate students. This section is followed by the theoretical background and then the emergence of the

proposed model. Finally the trajectories for future action are explained in the last section.

Review of Literature

In this section, the works on various learning models are reviewed and the corresponding inferences are tabulated.

Table 1 Literary Review Summary

S.No	Authors and Year of Publication	Model/Objective	Inference
1	Hannah Volk, Karl Kellner & David Wohlhart (2015) *Learning Analytics for English Language Teaching*	Learning Analytics Model	Analysis of learning behaviour of students in an e-learning environment to a better understanding and an optimization of their learning process.
2	Katrein Verbert, Erik Duval, Joris Klerkx, Sten Govaerts & Jose Luis Santos (2013) *Learning Analytics Dashboard Applications*	Learning Analytics dashboards	Potential to improve learning through dashboard Learning that provides awareness, reflection, sensemaking & impact.
3	Slate, John R.; Charlesworth, John R., Jr.(2007) *Information Processing Theory: Classroom Applications.*	Application of Information Processing theory to the classroom	A number of suggestions is provided as to how teachers can incorporate more of the new knowledge gained from the information processing theory into their classrooms. In addition, the model provides a strong theoretical rationale supporting many traditional teaching techniques.
4.	Yahaya Azizi (2015) *Information Processing and its Implications to Teaching and Learning*	Information Processing Model SP 030 007	Role of our metacognition to control our learning behaviours is elucidated. Incorporating various techniques into their teachings in order to improve students' motivation, selective perception, understanding, encoding, retrievals and problem solving is emphasized.
5.	Angella van Barneveld, Kimberly E. Arnold and John P. Campbell (2012) *Analytics in Higher Education: Establishing a Common Language*	Conceptual framework for the types of Analytics	Synthesised set of definitions for analytics-related terms commonly found in academia are proposed. The conceptual model contributes to the teaching practices.
6.	Andreas G. Kandarakis and Marios S. Poulos (2008) *Teaching Implications of Information Processing Theory and Evaluation Approach of learning Strategies using LVQ Neural Network*	Information Processing Model by Atkinson and Shiffrin	The model provides a helpful framework for thinking about memory and it also predicts the participation of different brain structures in each stage of processing.
7.	O'Malley, J. M., & Chamot, A. U. (1987). *The Cognitive Academic Language Learning Approach: A Bridge to the Mainstream.*	Integrated model of subject content, academic language and learning strategy Instruction.	Cognitive Academic Language Learning Approach (CALLA) is a bridge between bilingual / ESL instruction and mainstream classes and an added support for English language development among Limited English Proficiency (LEP) students
8.	Nivis Deda MA (2013)	Importance of pragmatics in language learning	Pragmatic competence will secure the learners good levels of grammatical and

	The role of Pragmatics in English Language Teaching. Pragmatic Competence		functional competences. Pragmatic competence stimulates the learner's critical thinking and moreover the learners will also react fluently, coherently, and accurately
9.	Bruno G. Bara. (2010). *Cognitive Pragmatics: The Mental Processes of Communication*	Theory of Human Communication is formalized by the logical model	The theory developed focuses on understanding the mental states of communicators and the processes by which they are formed and changed. This investigation includes mental processes and states involved in both comprehension and utterance production.

After reviewing the articles the researcher identified the gap and decided to create a new model by integrating Cognitive Information Processing, learning strategies, cognitive domain of Bloom's Taxonomy and components of pragmatics, which being the objective of this work. The next section overviews the different concepts to get clarification in designing a model to acquire the cognitive and pragmatic skills of the limited proficiency learners of undergraduate students.

Theoretical Background

In order to propose a new model to acquire the cognitive and pragmatic skills of the limited proficiency learners of the undergraduates, the researcher had to lay a foundation with concepts. Thus, this section delineates the different concepts that are required for the proposed model.

Cognitive Information Process

The information processing approach has led to a model of memory which is based on a computer analogy. By the late 1960s Atkinson and Shiffrin proposed the most influential model of memory (see figure 1). It was assumed that information came in from the environment, was processed by a series of temporary sensory memory systems (a part of the process of perception), and then fed into a limited capacity short-term store. This was assumed to act as a working memory. That is, a system for holding information and allowing it to be used to perform a wide range of cognitive tasks, including transfer into and retrieval from long-term memory. When one is bombarded by sensory stimuli, he/she must selectively focus on those elements which are likely to be most significant, which occurs through the process of attention. Unlike sensory memory that has a short duration and high capacity, short-term memory (STM), has a longer duration and a limited capacity based on continual rehearsal (manipulating the stimulus information in order to code the information for long-term memory). STM can be thought of as activated memory (working memory), necessary for feeding information into and out of the long-term memory.The last part of the model is the long term memory (LTM) that is reserved for memory of experiences and knowledge that occurred at some point in time prior to the immediate past or near present.

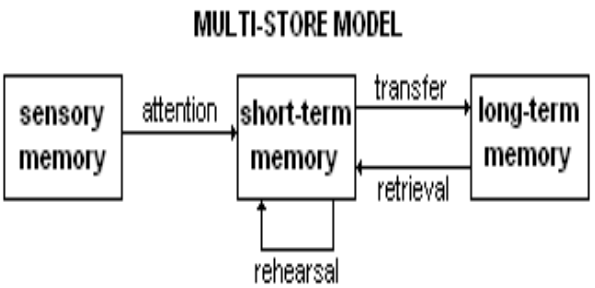


Figure 1 Multi-Store Model

Pragmatics

Thomas defined, pragmatic competence as "… the ability to analyze language in a conscious manner." (as cited in Holmes & Brown, 2007, p 524). Pragmatic competence refers to the ability to comprehend, construct utterances which are accurate and appropriate to the social and cultural circumstances where the communication occurs. The meaning of ideas was only found in the effects and consequences in experience, particularly those consequences brought about through shared experience. Consequently, pragmatists believed that improving the quality of communication practices was central to improving not only the state of knowledge, but the quality of our experience living together in a common world.

Pragmatics, also known as social language, refers to an individual's ability to use language for a variety of functions (i.e. to request, label, gain attention, greet/part, comment, ask for help, etc), vary language based on

audience or setting, and follow rules for conversation. Pragmatics includes the understanding and appropriate use of eye contact, facial expressions, and body language. When having a conversation with someone, one generally initiates with a greeting, introduces a topic, and takes turns commenting. Within that conversation, each person needs to be able to read the other person's tone, facial expressions, eye contact, and nonverbal cues to determine if their partner is still interested, when it is appropriate to interject or add a comment, and when it is time to end the conversation or change the topic.Rose (2001) in one of his studies argues that "pragmatics consciousness raising is basically an inductive approach to develop a general awareness of how language forms are used appropriately in context" (p. 171).From views of House, Kasper, and Rose (2003), the pragmatics is a type of knowledge that makes people detect the intercultural interaction structures and speech act strategies in order to resolve problems of misunderstanding encountered in the international social settings. Nivis Deda MA in the article 'The role of Pragmatics in English Language Teaching. Pragmatic Competence' propagates that 'The teaching of pragmatics aims to facilitate the learners' sense of being able to find socially appropriate language for the situations that they encounter. Within second language studies and teaching, pragmatics encompasses speech acts, conversational structure, conversational implicature, conversational management, discourse organization, and sociolinguistic aspects of language use such as choice of address forms.'

Based on these theories the researcher felt the components of Pragmatics could be Speech Acts, Socio-cultural competence, Transactional Competence, Strategic Competence, Discourse Competence and Interactional Competence and when proper training is been given to the learner's they would acquire the pragmatic skills.

Bloom's Taxonomy

Bloom's taxonomy is a set of three hierarchical models used to classify educational learning objectives into levels of complexity and specificity. The three lists cover the learning objectives in cognitive, affective and sensory domains. The cognitive domain list has been the primary focus of most traditional education and is frequently used to structure curriculum learning objectives, assessments and activities. The revision of the original Taxonomy is a two-dimensional framework: Knowledge and Cognitive Processes. The former most resembles the subcategories of the original Knowledge category. The latter resembles the six categories of the original Taxonomy with the Knowledge category named Remember, the Comprehension category named Understand, Synthesis renamed Create and made the top category, and the remaining categories changed to their verb forms: Apply, Analyze, and Evaluate. They are arranged in a hierarchical structure, but not as rigidly as in the original Taxonomy.

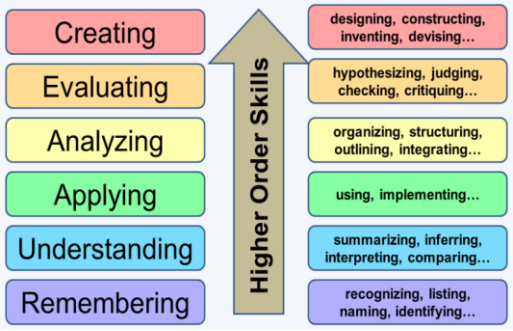


Figure 2 Bloom's Revised Taxonomy

Learning Strategies

Learners tend to apply a variety of strategies while learning in order to make sense of the text. Cognitive (e.g., making predictions, translating, summarizing, linking with prior knowledge or experience, applying grammar rules, and guessing meaning from contexts) and metacognitive (e.g., self-management or self-regulation, planning, and monitoring strategies) strategies are the two most important strategies that are required to achieve an understanding of the text in the sense that learners need to not only notice their thinking, but also to plan and evaluate their processes. Cognitive and metacognitive strategies, then, help learners read independently and remember what they have read. After analysing the above mentioned theories the researcher had planned to disseminate a new Learning Analytics Model based framework to acquire the cognition and pragmatic skills of the undergraduate students.

Proposed Learning Analytics Model on Cognitive Pragmatics (LAMCoP)

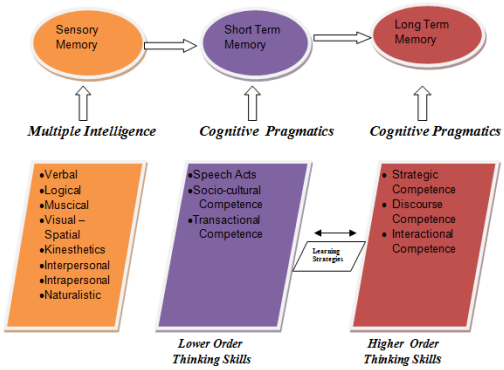
Forty undergraduate students each from the departments of English and Social Sciences were assessed to identify the limited proficiency learners by using the assessment tools such as **Brief Cognitive Status Exam** that helps evaluate global cognitive functioning. It covers seven cognitive domains: Orientation, Time, Mental Control, Planning and Visual- Perceptual Processing, Incidental Recall, Inhibitory Control, and Verbal Productivity. **Cognitive Linguistic Quick Test-Plus (CLQT+),** which was designed to assess the strengths and weaknesses in six cognitive domains

(Attention, Memory, Executive Functions, Language, and Visuospatial Skills and semantic comprehension task). **Speed and Capacity of Language Processing Test (SCOLP),** which has two separate measures. One is the Speed of Comprehension Test that allows the rate of information processing to be measured, and the other is Spot-the-Word Test which provides a framework for interpreting the results of the first test. SCOLP enables differentiation between a subject who has always been slow and a subject whose performance has been impaired as a result of brain damage or some other stressor. **WASI–II** India provides a brief, reliable measure of cognitive ability (IQ). **The Wellbeing Evaluation Scale (WES)** is a brief, self-report measure designed to measure wellbeing namely Integrity of self, Integrity of others, Belonging, Agency, Enrichment and Security. Thirty eight students who had an average score of fifty in the above mentioned assessment were selected for the training. Based on the students' needs a learning analytics model was proposed to improve their cognition and pragmatic skills.

The proposed model (LAMCoP-2018) is based on Cognitive Information Process to acquire the cognitive and pragmatic skill of the undergraduate students. Atkinsons' Memory Framework that consists of three memory namely Sensory memory, Short Term memory and Long Term memory are interconnected and is used as a base to acquire the learning process of the pragmatic skills of the undergradute students, in order to convert the learning from the short term memory into a long term memory. According to Gagne et.al (1993), when we attempt to comprehend memories and retrieve information, stimulation from the environment activates the receptors. Therefore the learners' senses are stimulated by Multiple Intelligence through various activities as a beginning of the students' learning. All the information from the environment is transferred to the short-term sensory store for two functions. First of all, it filters out unimportant background information and attends to important information by the process of selective perception.

As per the Bloom's Taxonomy the Pragmatics components are divided into lower and higher order thinking skills in the model. The learning strategies which unites the lower order and higher order thinking skills are Cognitive strategies and Metacognitve strategies of learning. Cognitive strategies consisting of Concept Mapping, Reinforcement, Visualization, Making Associations, Chunking, Questioning, Scanning, Underlining, Accessing Cues, Sounding out words, Self-checking and Monitoring and Metacognitive strategies constituting preparing , selecting, monitoring, orchestrating and evaluating are the two types of learning strategies that learners use in order to learn more successfully. The components of pragmatics such as Speech Acts, Socio-cultural competence,Transactional competence, Strategic competence, Discourse competence and Interactional competence are mastered and imbibed by the learners by applying cognitive and metacognitive learning strategies.

Learning Analytics Model on Cognitive Pragmatics (LAMCoP- 2018)



Conclusion

The undergraduate students who take up the training according to this Learning Analytics Model on Cognitive Oragmatics (LAMCoP) will acquire the required and desired cognition and pragmatic skills in English for a better comprehension, communication and maintenance of a smooth relationship with confidence. Furthermore, the implementation of the LAMCoP model opens new horizons in a new approach of designing a syllabus, producing materials and evaluating the strategies of cognition and pragmatic skills based on LAMCoP model that may be undertaken in future.

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