From Cognitive to Meta-cognitive Strategies: Integration of Grammar Learning in MALL Environment

Nadia Refat
Modern language and Human Sciences
University Malaysia Pahang
Gambang, Malaysia
atoshi.refat@gmail.com

Haffizoah Kassim
Modern language and Human Sciences
University Malaysia Pahang
Gambang, Malaysia
hafizoahkassim@gmail.com

Abstract— Cognitive learning refers to the process or operation used for learning that requires direct synthesis of learning materials. On the other hand, metacognitive learning involves thinking of the learning process. The first approach of learning is cognitive understanding while the metacognitive entails the options of enhancing the understanding of the learning progress. In a technology enhanced environment, more specifically using mobile devices for learning, helps further to accelerate the both process of learning. It is observed through empirical studies that language learning can be improved through using cognitive and metacognitive strategies. Grammar as a crucial part of language learning is also taking a noticeably important part where learning process is mixed from cognitive to metacognitive steps. In using mobile for grammar learning, learner first infer or guess the task from the context through mobile and elaborate it from the previous experience or relate it to new experience to the other concept of memory. It is learners' cognitive ability that he or she is applying for learning, while using different applications, web searches are working as metacognitive strategies to improve the learning. Previous studies either focused the traditional approaches or computer assisted language learning but in modern era where mobile is used widely, it is noteworthy to take initiate for facilitating grammar learning through cognitive and metacognitive strategies. This should be integrated by following well-designed instructions and proper modelling of grammar learning strategies.

Keywords— *cognitive learning, metacognitive learning, grammar, Mobile Assisted Language Learning*

1. INTRODUCTION

Learning strategies plays an important role in the language learning process. It has gained the attention in different research since 1970 (Anderson, 1991, 2003; Cohen, 1990, 1998; Hosenfeld, 1979; Oxford, 1990, 1993, 2002; Wenden, 1991, 2002). Learning strategies refer to understanding, remembering and using information that are consciously controlled by the cognitive ability of the learner. Learning starts from cognition of the task to different level of capability to improve that knowledge of the learners.

Proper knowledge of grammar enables a learner to perform effectively in every skill because he or she understand how sentences intricate meaning and render subtle meaning. Consequently, students are likely to be more analytical and receptive readers. Likewise, knowledge of grammar also allows for better speaking skills by eliminating misunderstanding. Those who speak well tend to sound more mature and professional. Moreover, learners can write with the correct grammar of the language if they are equipped with enough grammatical knowledge.

Grammar learning through mobile device is a new concept that has extended the capacity of the learners. While they are learning grammar using multimedia instructions their cognitive ability to understand the task become easier than only going through text reading or face to face classroom activities. They have a little option of feedback in traditional grammar learning. Besides using mobile, learners can use different grammar learning application as well to improve the prior knowledge on a specific task related to grammar. Functioning with different ways of enhancing their grammar knowledge is meta cognition which excellently takes part to enhance the expertise on grammar.

2. WELL-DESIGNED INSTRUCTIONS IN MALL AND COGNITIVE LEARNING

Learning is a process that needs proper information processing and connection to the different level of memories. Cognitive strategies process the information directly to our senses and memories and manipulates the information that enhance learning (O'Malley & Chamot (1990). It is grouped under three broad categories: rehearsal, organization, and elaboration that are also consisted of other strategies that depends on prior knowledge in long-term memory and keeps in the process of inferencing, summarizing, deduction, imagery and transfer (Mayer et al ,1986).

Instructional design is considered the determination of educational requirement for learners. As a result, several instructional design theories have emerged on the development of effective learning systems that have ultimate effect to constructing materials according to the purpose of learning (JaliBalban, 2008). Theories of learning propose that materials need to be designed in a way that can manage learning load and would not force learners to move on before they have learned the current material. Accordingly, instructions should be designed to integrate knowledge about the structure and functioning of the human cognitive system.

Designing is still a challenge for designers if the instructional design is done accordingly (e.g., maintaining the learning principles). Designing fault cannot really work out for proper learning. An example of a fault in the task, mobile assisted learning does not necessarily help students when pictures and graphics are omitted to instruction; it is often incredibly beneficial to students without prior knowledge of a specific subject, but distracting to students with knowledge of the specific subject being taught. Sometimes the tasks or content can be the cause of poor instruction if the context does not maintain modality principles. It presents words or pictures rather than only presenting text. This principle allows the students to enhance the capacity of their working memory. Another fault is related with contextual use of instruction that has a great impact on designing a proper mobile assisted learning tool. Therefore, it is crucial to have a proper knowledge on instructional design for creating and using it on learning purpose.

3. PRINCIPLES OF INSTRUCTIONAL DESIGN MAINTAINING THE COGNITIVE THEORY OF MULTIMEDIA LEARNING

Cognition works best when the instructions are designed in effective way. Mayer (2009) researches and suggests a number of principles of cognitive learning for multimedia-based learning materials where in this study we will focus on six principles:

- Multimedia Principle – It is observed that human being has the more capacity of understanding when pictures and words are presented together to make any message than from words alone.

- Spatial Contiguity Principle –This principle signifies the rule that people learn better when corresponding words and pictures are placed near each other rather than far from each other on the page or screen.

- Redundancy Principle – it is better to avoid redundancy in learning materials. It is learning from graphics and narration than from graphics, narration, and printed text.

- Modality Principle – Learning occurs better from graphics and narration than from graphics and printed text.

- Temporal Contiguity Principle - When corresponding words and pictures are presented at the same time rather than in succession it helps to get better information processing.

- Coherence Principle –When extraneous material is excluded it helps the learners not to become diverted from the right information. Thus the principle suggests to exclude extra messages.

4. PROPER MODELLING OF LEARNING STRATEGIES

Metacognition is the combination of various attended thinking and feedback with reflective processes. It can be classified in three ways (1) preparing and planning for learning, (2) monitoring strategy use, and (3) evaluating strategy use and learning.

A. Preparation and planning for learning

Preparation and planning are important metacognitive skills which helps to improves student learning. In every task there needs a planning or preparation for achieving the goal. From their planning students can think about what are they going to do and how they can finish the work. In grammar classes or individual practices teacher and learner respectively can do the setting that what are the requirement to complete the particular grammar task. For example, if the student is learning English tenses, they should now what is the function and how it helps in real life usage. once they know their achieving goal they can easily measure their achievement.

B. Monitoring Strategy Use

Monitoring is essential for grammar learning strategies as with help of monitoring students are better able to keep themselves in line. It is necessary to select one of the strategy to meet the goal. For instance, when a learner is using conditional sentence structure, he must know what should be given before the 'if' and after the' if'. To know more specifically they can see the other examples from using any applications that has explained the use of conditional sentence.

C. Evaluating Strategy use and learning

Evaluation is the most important part because the strategies that are been followed in metacognition process must be evaluated properly to get the knowledge of the achievement of the student. Second language learners are actively involved in metacognition process as it is the part where learners evaluate their own gathering of knowledge whether what they are doing is effective. This step of evaluation goes through the response of the learners to the teacher's questions which are meant to judge their cognitive abilities of enriching with the information. Teachers can help students evaluate their strategy use by asking them to respond few questions regarding their achievement, procedure or strategies of accomplishing the work, confidence of performing the job or finding any alternate path to accomplish the task. Responding to these questions integrates related aspects of metacognition, allowing the second language learner to reflect through the cycle of learning.

5. MALL ENVIRONMENT IN GRAMMAR LEARNING

Mobile assisted (MALL) entails cell phone, smart phone, PDA and all the mobile devices that capable web based learning. Web based learning system enhances the ubiquitous of mobile devices (Webster and Watson ,2002). Using internet facility, the learners are able to use different grammar learning tools. The concept of mobile assisted language learning is likely to become accepted by more and more learners. There are so many evidence that proves that MALL is a emerging area of studies to work with for language learning purposes specially for grammar learning. Mobile phones are becoming more widely used in learning grammar, as is shown in a number of studies (Chen & Chung, 2008; Kennedy & Levy, 2008; Lu, 2008; Pincas, 2004; Stockwell, 2008; Stockwell, 2010; Thornton & Houser, 2005; Yamaguchi, 2005). There are many advantages to using mobile phones for grammar learning such as it provides flexibility by giving the opportunity to use it anywhere. Learners are not to bound with time limitation of classroom teaching. With the assistance of mobile phone, it is also convenient for the learners to understand the items of grammar in different examples and exercises with more variations. This facility encourages the learner to know more about grammar learning. They have the opportunity of feedback as well through mobile assisted language learning system.

6. INTEGRATION OF COGNITIVE PROCESS AND STRATEGIES FOR GRAMMAR LEARNING

In a MALL environment, it is observed that with the help of multimedia learning process in much more enhanced than the traditional method of face to face or book oriented knowledge. Here the learner can utilize their senses effectively without load on working memory if the instructions are properly designed. Cognition through image or words work firstly in sensory memory. Then they are received in working memory and finally reached to prior knowledge which is also called long term memory. This cognitive process is taken through different strategies such as playing game, internet surfing, using you tube and many more tool that are designed for grammar learning. Once the learning content is achieved through cognitive process in long term memory the then it is used as prior knowledge and returns to working memory in the process of starting the learning. Meta cognition here works as support for better learning. It is effective in a MALL environment to use our cognitive activities with more dimensions and enhancements.
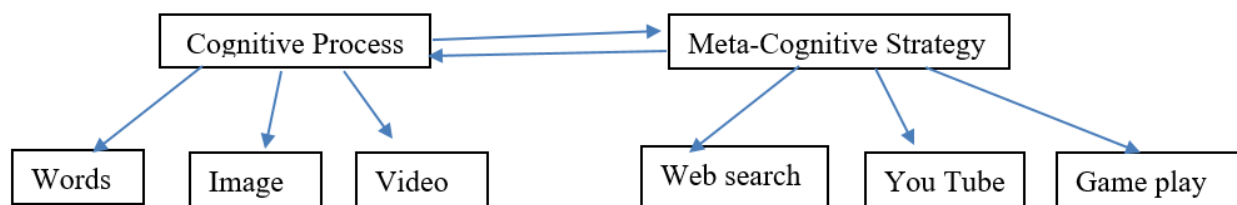

Figure 1: Integration of cognitive process and metacognitive strategies

7. CONCLUSION

It is very important to integrate cognitive strategies and metacognitive strategies for the success of effective grammar learning. It is experimented separately through different studies that learning with mobile with proper instructional design and different learning strategies can enhance their capacity to use grammar in every aspect of language skill.

REFERENCES

[1] Anderson, N. J., "Individual differences in strategy use in second language reading and testing," Modern Language Journal, 75, 1991, pp. 460-472.

[2] Cohen, A. D., "Language learning: Insights for learners, teachers, and researchers," New York: Newbury House, 1990.

[3] Chen, C-M., & Chung, C-J., "Personalized mobile English vocabulary learning system based on item response theory and learning memory cycle," Computers and Education, 51, 2008, pp. 624–645.

[4] O'Malley, J & Chamot, A., "Learning strategies in second language acquisition," Cambridge University, 1990.

[5] Oxford, R. L., "Language learning strategies: What every teacher should know," New York: Newbury House Publishers, 1990.

[6] Oxford, R. L., "Research on second language learning strategies," Annual Review of Applied Linguistics, 13, 1993, pp. 175-187.

[7] Oxford, R. , "Language learning strategies," In R. Carter, & D. Nunan (Eds.), The Cambridge guide to teaching English to speakers of otherlanguages , Cambridge: Cambridge University Press, 2002, pp. 166-172.

[8] Weinstein, C. E. & Mayer, R., "The teaching of learning strategies," In M. C. Wittrock (Ed.), Handbook of research on teaching . New York: Macmillan, 1986, pp.315-327.

[9] Webster, J., & Watson, R,"Analyzing the past to prepare for the future: writing a literature review". MIS Quarterly, 26(2), xiiixxiii, 2002.

[10] Wenden, A. L., "Learner development in language learning". Applied Linguistics, 23, 2002, pp. 32-55.