

Full Length Research Paper

The development of foreign language substance group curriculum based on Marzano's taxonomy

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This study was firstly aimed to develop the Foreign Language Substance Group Curriculum for enhancing students' four English skills required to promote learning in the different areas of subject. It used Marzano's Taxonomy as a framework for curriculum design. To articulate this framework, the study used content-based instruction (CBI) to pave a way for the meet of academic contents and colorful English experiences. Population of the study were the sixth grade primary students of Lakmuang Mahasarakham School located in the Northeastern of Thailand. Development procedures went through four stages. The first stage required fundamental data relating to the population's needs and interests. In the second stage, the curriculum was drafted. Different curriculum materials were developed as well. Prior to use, the curriculum and its materials were brought to the experts for suggestions to ensure their quality. In the third stage, the curriculum was implemented to the 40 primary students in the sixth grade purposively selected from the population mentioned. In this stage, the one group time –series design was adopted. In the last stage, the curriculum was required to determine its efficiency including being revised. The findings were four dimensions. Post-test score of both achievement test and unit test were significantly higher than the pre-test score. The metacognition and self-system were reported positively. The efficiency index of the curriculum developed was higher than the established requirement. The students' opinion toward the curriculum was positive. Additionally, the students' English skills were supported.

Key words: Curriculum development, taxonomy, content-based instruction, educational objectives.

INTRODUCTION

The term "curriculum" is generally used in the field in two ways. One is that it indicates, roughly, a plan for the education of learners. This is referred to the curriculum itself that its ingredients are open for debate. For the last one, it is viewed as a field of study that the range of subject matters concerned are noticed. Curriculum in this view is also defined by the procedures and practices. These common views make curriculum welcome for being widely interpreted in different dimensions including as the program of studies, as course content, as planned

learning experiences, as relevant experiences, as a structured series of intended learning outcomes, and as a plan for action (Zais, 1976).

However, the general concepts of curriculum as mentioned reflect only a fraction of a number of ideas or positions. According to Schwab (1969), the curriculum field is moribund because of its preoccupations with theoretical points. The curriculum field in other aspects, therefore, includes a number of areas of concepts termed as curriculum foundations, curriculum design, curriculum

construction, curriculum development, and curriculum improvement (Zais, 1976).

Concerning relevant experiences and learning outcome or goals of the schooling process (Howell and Nolet, 2000; Zais, 1976; Squires, 2005), as terminal points, curriculum is developed through deliberate analyses, interpretations, and understandings of curricular or world phenomena. This is based on values and ideological perceptions of world contexts defined as foundation of learners' interests and problems. Curriculum development dealing with creating education and carrying on the construction process is of values hidden, therefore. It tries to link the society (desired values) to the school (Welch, 1969).

Curriculum development process systematically organizes what will be taught, who will be taught, and how it will be taught. This is aimed at creating teaching and learning environments that would bring about desired changes in learners, whether to be more knowledgeable, better skilled or to influence their attitudes and values positively. In curriculum development process, several theoretical frameworks considered concerning these terms are surveyed. Definition, design as the starting point, process, and evaluation are evident for being the central concepts. According to curriculum development, one of the outstanding features has been the emphasis on the integration of all the components, generally comprising of objectives, contents, teaching strategies and learning activities, and evaluation, which support and develop learning, and the necessity for alignment between these components for them to be truly effective (George, 2009; Wongyai, 1994). However, curriculum development among the rapid changes of world contexts is multifaceted. This condition makes the curriculum reasonable to be continuously reevaluated and revised as well.

Providing curriculum that can bring about students' engagement with academic content and language skills has been an issue of concern and research agenda in Thailand. One of challenges that educational communities have faced in this talent design is to marshal the theoretical ideas for developing curriculum. As a result, different theories or concepts that are assumed to be fit with this meet are tested.

From this flaw, the present study is made up around the three concepts; theoretical curriculum, Marzano's Taxonomy, and content-based instruction (CBI). The study raises two questions. The first one is *What are the key components of the Foreign Language Substance Group Curriculum based on Marzano's Taxonomy?* And the other one is *How efficient is the Foreign Language Substance Group Curriculum based on Marzano's Taxonomy in terms of promoting students' English skills for learning the Science Substance Group?*

From scratch in searching for answers to these questions, the study was firstly aimed to develop the Foreign Language Substance Group Curriculum for

enhancing students' four English skills required for being a tool for promoting learning in the different areas of subject. It was also aimed to evaluate the curriculum developed in terms of efficiency.

Literature review

English and Thai basic education core curriculum

From the perspective on strong competitions among nations and pressures in the age of globalization, Thai government addresses the concerns of the importance of English. According to the Basic Education Core Curriculum B.E. 2551 (A.D. 2008), Learning Area of Foreign Languages stated that "In the present global society, learning foreign languages is very important and essential to daily life, as foreign languages serve as an important tool for communication, education, seeking knowledge, livelihood and creating understanding of cultures and visions of the world community.....The learning area for foreign languages is aimed at enabling learners to acquire a favourable attitude towards foreign languages, the ability to use foreign languages for communicating in various situations, seeking knowledge, engaging in a livelihood and pursuing further education at higher levels.....The foreign language constituting basic learning content that is prescribed for the entire basic education core curriculum is English" (Ministry of Education, 2008).

With embarking on ambitious educational reforms, English was integrated more deeply and variously into the curriculum for different purposes. It becomes a basic skill necessary to be learned. Learning English was termed in four strands or areas including for Communication, Culture, Linking to Other Learning Areas, and Making Relationship with Community and the World. To serve these intentions, creating innovation in different places, such as developing curriculum, teaching, learning, and so on, has been promoted.

Because of lack of previous research work and being an unfamiliar and complicated dimension, the Strand 3 (English and relationship with other learning areas) opens an opportunity for educators and researchers to contrive new learning strategies and experiences for students. This is expected that learners can be able to link English skills with other learning areas, forming the basis for further development, seeking knowledge and broadening learners' world views (Ministry of Education, 2008). Its Standard F3.1 specified that "Usage of foreign languages to link knowledge with other learning areas, as foundation for further development and to seek knowledge and widen one's world view" (Ministry of Education, 2008). Unfortunately, this is still very much an issue. The strand is most notable for its neglect. Creative work on this strand has been rarely found.

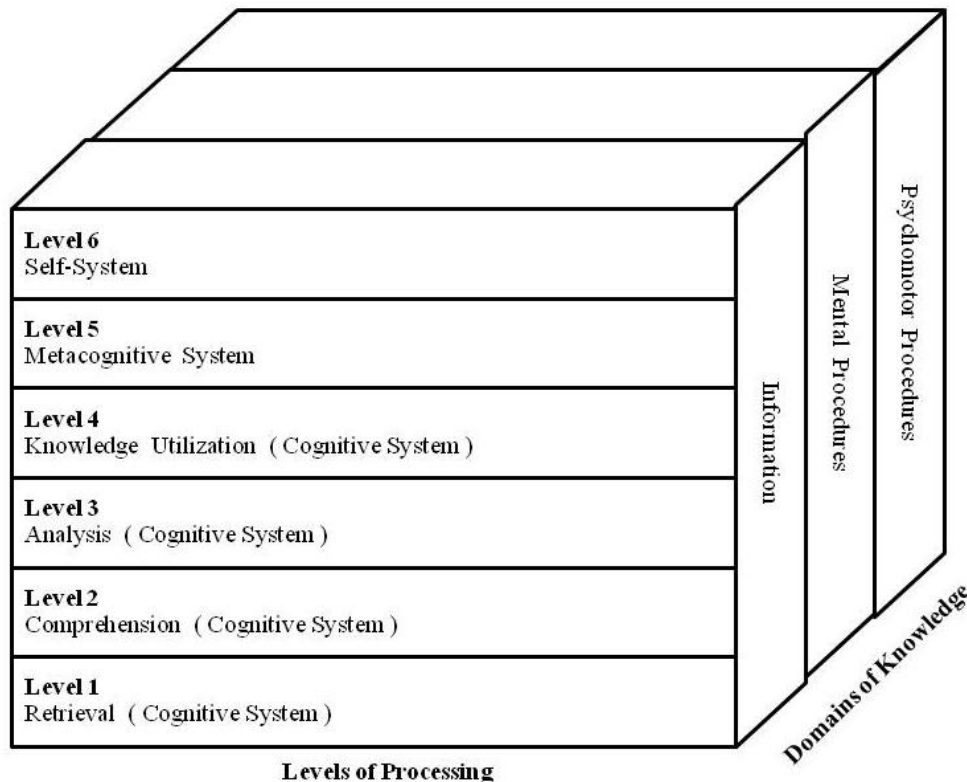


Figure 1. Marzano's taxonomy.
Source: : Marzano and Kendall (2008)

Marzano taxonomy

Taxonomy of education objectives has been an important source for investigations of curriculum since it was first introduced by Bloom. Since then, it has been used as a framework for classifying statements of what we expect or intend students to learn as a result of instruction (Krathwohl, 2002). Generally said, one of the most frequent uses of the original taxonomy has been to classify curricular objectives and test items in order to show the breadth, or lack of breadth, of the objectives and items across the spectrum of categories (Krathwohl, 2002). The traditional version remains its influence on education as foundation for determining educational objectives and guiding curriculum development although it has been revised several times.

Marzano released the new version of taxonomy called *The New Taxonomy of Educational Objectives (2000)*. He has given Bloom's taxonomy a bit of working over. He claimed that this was responded to the shortcomings of the widely used Bloom's Taxonomy. "The New Taxonomy is designed as a replacement for Bloom et al.'s taxonomy. Although that work was powerful and enduring, it had some flaws and inconsistencies that can now be reconciled....." (Marzano and Kendall, 2008).

The New Taxonomy is two-dimensional. One dimension addresses levels of mental processing. Instead of

categorizing learning activities, it describes six levels of processing knowledge of mental process. And the other addresses three domains of knowledge. This taxonomy can be represented as depicted in Figure 1. The rows on the left-hand side of the figure represent three systems of thought including Cognitive System, Metacognition System, and Self-System. The column on the right-hand side of the figure depict three different types or domains of knowledge including information, mental procedures, and psychomotor procedures. These domains provide the content.

According to the six levels of processing knowledge, the highest level (6) denotes the so-called Self-System that contains a network of interrelated beliefs, attitudes and expectations that are involved in making judgments as to whether to engage in a new task. It is at this level that the motivation of accomplishing the goal is determined. If the decision is made to engage in a new task, the metacognition system (Level 5) is activated. At this level, goals relative to new task would be defined and strategies would be developed for reaching these goals. Finally, the Cognitive System (Level 1 to 4) is responsible for the effective processing of the knowledge (Teodorescu, 2009). Retrieval objectives involve the recognition, recall, and execution of basic information and procedures. Comprehension objectives involve identifying and symbolizing the critical features of knowledge.

Analysis objectives involved reasoned extensions of knowledge. It involves five types of analysis processes: matching, classifying, analyzing errors, generating, and specifying. Knowledge utilization objectives are employed when knowledge is used to accomplish a specific task. It includes four knowledge utilization processes: decision making, problem solving, experimenting, and investigating (Marzano and Kendall, 2008).

Content-Based Instruction (CBI)

Content-based instruction (CBI) reflects a bit of difference in definitions in which the key concept is recognized. According to Brinton et al. (1989), CBI is defined as the integration of content learning with language teaching aims. It is the "concurrent study of language and subject matter, with the form and sequence of language presentation dictated by content materials. It represents the integration of particular content required for higher education or any purposes with language teaching aims (Brinton et al., 2003; Kwangsawad, 2005). It views language as the vehicle for learning content rather than the focus or object of instruction per se. It focuses on language use and strives to integrate language learning and cognitive development to provide the requisite motivational basis for purposeful communication (Lyster, 2007). In conclusion, CBI is an instructional approach in which non-linguistic curricular content is taught to students through the medium of a language that they are concurrently learning as a second, heritage, indigenous, or foreign language (Brinton et al., 2003).

Content-based instruction realizes that language acquisition is based on input that is meaningful and understandable to the learners (Krashen, 1985a, 1985b). Through this approach, learners develop language skills while simultaneously becoming more knowledgeable about the world they live in. Therefore, its instruction lessons can overcome the barrier between language and subject matter courses.

The content-based approach has been also viewed as a viable alternative to traditional foreign language instruction (Bueno, 2002; Dupuy, 2000; Moeller, 1994). It steps out from the traditional approach by offering an interesting way for learning language in that the fundamental organization of the curriculum based on it is derived from the subject matter, rather than from forms, functions, or situations (Stryker and Leaver, 1997). The material used for instruction consists primarily of authentic texts produced for native speakers. Students are immersed in the foreign language while learning the content of other areas. The foreign language is used to learn new information that is appropriate to the cognitive and affective needs of the learners and to the proficiency level of the class (Liaw, 2007). The focus on content of different subjects is essential for developing language proficiency and meeting students' professional and personal goals (Bragger and Rice, 1999; Hoecherl-Alden,

2000; Peck, 1987; Snow and Brinton, 1988).

Since lack of curriculum providing students' engagement with academic content and English skills being an issue of concern and research agenda in Thailand, this study problematizes a research agenda which lies at the interface of several fields. The study, thus, takes the initiation from this flaw. It uses Marzano's taxonomy as a framework for facilitating curriculum development providing students' engagement with academic content and English skills.

According to Marzano's taxonomy, it invites educational exploration via levels of mental processing and domains of knowledge. It can articulate what are actually needed to accomplish. Additionally, it provides the area for the meet of different disciplines. These characteristics can pave an explicit route for curriculum development and yield meaningful teaching, learning, and assessment.

METHODOLOGY

Procedure

The development of Foreign Language Substance Group Curriculum based on Marzano's taxonomy providing students' engagement with contents on Science Substance Group and English skills was broken down into four stages; collecting students' present needs and interests accompanying with literature review, providing curriculum draft, curriculum implementation, and curriculum evaluation and revision.

The study began its first stage in the second semester of the academic year 2010. In this stage, students' present needs and interests were surveyed. The participants included 354 primary students in the sixth grade at Lakmuang Mahasarakham School, a school in Mahasarakham province located in the Northeastern Thailand. To meet the students' needs and interests, survey instrument was developed around the topics of the learning units (based on Council of Europe) of the science substance group. Here came the rating scale consisting of five utterance options. The rating scale was, then, supplied to the participants. It required those of them to identify the topic of each of five units that they were interested. The results were as follows:

Unit 1 Life and Environment
Topic: Animal Life Cycles
Unit 2 Energy
Topic: Solar Energy
Unit 3 Earth and Its Change
Topic: Seasons
Unit 4 Astronomy and Space
Topic: Exploring Space
Unit 5 Science and Technology
Topic: Invention

At the same time, related literatures addressing on the Basic Education Core Curriculum B.E. 2551 (A.D., 2008), theoretical ideas about curriculum, Marzano's Taxonomy, and Content-based Instruction (CBI) were reviewed and interpreted.

In the second stage, the curriculum was drafted denoting to the Strand 3 '*English and Relationship with Other Learning Areas*'. This was based on the premises that were consistent with Marzano's Taxonomy-- a framework providing educational objectives, tasks, and assessments-- and CBI lessons administered to the acquired topics of the five units of the science substance group. This stage was administered into three arenas. The first one was inventing the

Table 1. Relationship among topics, taxonomy level, and type of knowledge.

Content	Taxonomy level	Type of knowledge
Unit 1: Life and Environment Topic: Animal Life Cycles	Level 1 Retrieval: Recognizing and Recalling	Information
Unit 2: Energy Topic: Solar Energy	Level 3 Analysis: Matching	Information
Unit 3: Earth and Its Change Topic: Seasons	Level 3 Analysis: Generalizing	Psychomotor Procedures
Unit 4: Astronomy and Space Topic: Exploring	Level 2 Comprehension: Integrating	Information
Unit 5: Science and Technology Topic: Invention	Level 3 Analysis: Classifying	Information

The body of the curriculum that was emerged through six components, as a scaffolding. According to the principles of the curriculum, the first component, it was intended to serve experience transfer between English experience and content experience (the Science Substance Group) occurring within the framework provided by Marzano's taxonomy and CBI. The rests included curriculum objectives, structure of contents, learning activities, tools, and assessments. Regarding these components, taxonomy level and type of knowledge were specified for each topic. This relationship was exhibited according to Table 1.

As for the second area, a small textbook providing knowledge based on the topics mentioned was yielded. In the last area, lesson plans were created for implementing each topic. Each lesson plan described the details of the seven subtopics including unit title, learning standards, learning objectives, content, learning and teaching activities, tools, and assessments.

Additionally, assessment tools were developed for the four appraisals. Cognitive assessment was made by multiple choice. It was administered to the students on both pretest and posttest in every unit. For metacognitive and self-system assessments, they aimed to know students' engagement in specifying goals, process monitoring, monitoring clarity, monitoring accuracy, examining importance, examining efficacy, and examining emotional response. The assessments were planned to organize after students completely finished from engaging to the assigned tasks or activities. The data collecting tools were designed in form of rating scale. For the third dimension, the students were required to elicit their satisfaction toward the curriculum. This assessment was administered to students in terms of rating scale. At the end, the students were required to evaluate their comprehensive academic content and English skills. In this session, the assessment tools were divided into three subcategories including multiple choices, writing, and oral speaking. The multiple choice was based on taxonomy level and types of knowledge or contents. It was administered to the students before the first unit was run and after the last unit was completely run.

Prior to use, all materials were required to ensure their quality. For this concern, the drafted curriculum, the textbook, and the lesson plans were presented to the experts to reflect the perceived quality of them according to the rating scale information provided. The IOC index based on the experts' judgments was applied to the drafted curriculum, the unit assessment tools, the comprehensive learning achievement assessment tool, and the satisfaction

assessment tool. Additionally, the satisfaction assessment tool was required to meet the Item Total Correlation and the Coefficient Alpha criteria. For the existing unit assessment items and the comprehensive learning achievement assessment items, they survived from the *difficulty index* and the *discrimination index* tests. This session was conducted in the second semester of the academic year 2011 in which 39 students in the school mentioned earlier were the participants.

In the third stage, the curriculum accompanying with the materials was implemented to the 40 primary students in the sixth grade purposively selected from the participants in the school mentioned and who did not receive the *difficulty index* and the *discrimination index* tests. This was in the first semester of the academic year 2012. The whole process took 20 hours. To provide data for analyzing, the one group time - series design was adopted.

In the last stage, the data collected in the previous stage were analyzed. The curriculum and all materials were, then, revised.

Population

The entire population in this study consisted of 354 primary students in the sixth grade at Lakmuang Mahasarakham school, a school in Mahasarakham Province located in the Northeastern Thailand. However, these numbers were different when they were applied to differently purposes of participation. In the first stage of the study, the entire population participated the study to express their needs and interests in learning English via the information provided. The second participation required 39 students to examine the *difficulty index* and the *discrimination index* of the unit assessment items and the comprehensive learning achievement assessment items. Finally, curriculum implementation required 40 students purposively selected and who did not receive the *difficulty index* and the *discrimination index* tests.

Measurements and materials

The key materials in this study were divided into three categories. The first ones were mainly fundamental for curriculum implementation. These included the curriculum itself, the textbook, and the lesson plans. The second group were provided to support the lesson plan administering to the class. These comprised various

teaching aids. The last ones were a set of assessment tools.

Concerning measurements, different levels of taxonomy required to be assessed. Data were elicited with the assessment tools mainly developed around Marzano's taxonomy. For cognitive assessment section, it was assessed by multiple choice items. This assessment took place before and after the running of each topic. Regarding metacognitive assessment, it aimed to evaluate students' engagement in specifying goals, process monitoring, monitoring clarity, and monitoring accuracy. This assessment was applied to the students suddenly after they had finished their engagement in tasks or activities assigned. The assessment tool required the students to indicate their engagement in the terms mentioned by selecting the rating utterance options. According to self-system assessment, it aimed to know the students' motivation to new contents and tasks in terms of three aspects including examining importance, examining efficacy, and examining emotional response. Like metacognitive assessment, self-system assessment was applied to the students suddenly after they had finished their engagement in tasks or activities assigned. To elicit data, rating scale was employed. After all the lesson plans had been completely run out, the students were required to express their satisfaction toward the whole process of teaching and learning. This assessment was served by rating scale.

Without doubt, students' competencies in language skills and content comprehension were assessed also. The assessment tool in this term included multiple choice items applied to the students before the beginning of running the first lesson plan and after the ending of running the last lesson plan.

Regarding competency in speaking and writing, it was indicated through students' performance on tasks or activities assigned. Every hour of curriculum implementation, what each student produced relating to speaking and writing were observed and then recorded on individual recording document.

Data analysis

According to the data collected by the survey tools, they were analyzed into mean scores and percentage. To compare the difference of students' performance between pretest and posttest, Wilcoxon Signed Rank test was applied. E_1/E_2 efficiency index is used to indicate the efficiency of the curriculum developed. Data obtained from observing and recording were interpreted for key and simple criteria including meaning, structure, and fluency, for speaking, and spelling, meaning, structure, and handwriting, for writing.

RESULTS

The need to develop curriculum providing students' engagement with academic content and language skills guided by Strand 3 '*English and Relationship with Other Learning Areas*' of the Foreign Language Substance Group of the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) was the inspiration of this study. The study used Marzano's taxonomy as a framework for designing educational objectives, learning activities or tasks, and assessments. It was administered to four stages. Results of the study, therefore, were made around analyzing this newly developed curriculum and reported in sequence according to these stages.

The study began its first investigation by taking a survey on students' needs and interests towards different

topics picked up from the theme of English language related to the science substance group. It revealed that Animal Life Cycles, Solar Energy, Seasons, Exploring Space, and Invention were the most interesting topics for the students. According to the five levels of rating scale, each topic yielded *mean score* as 4.61, 4.62, 4.68, 4.42, and 4.31 respectively.

Based on information obtained in the first stage, the curriculum was drafted denoting to the Strand 3 mentioned. It was evolved around Marzano's taxonomy and CBI, as a scaffolding. It shaped its feature through six components including principles, curriculum objectives, contents, learning activities, tools, and assessments.

Then, the drafted curriculum was presented to the experts to reflect their opinion in terms of appropriateness and congruence. It yielded mean score and IOC index as 4.53 and 0.989 respectively.

In the stage of curriculum implementation, data analysis was established in seven different ways. The first two ones were made for unit test and learning achievement test addressing on language skills and content comprehension. Data were analyzed for the purpose of comparison between pretest and posttest. According to the five-unit test, mean score of posttest of every unit were higher than those of pretest. The result of the Wilcoxon Signed Rank Test on every unit was statistically significant as $p < .01$. Regarding learning achievement test, it yielded mean score of posttest as 32.60 from 40 of full score. This was higher than that of pretest (12.48). It produced Wilcoxon Signed Rank Test at 37.127 which reached significance at the $p < .01$ level.

For Metacognition and Self-System assessments, positive results were found. Their mean scores were above half of the top value of rating scale. According to Metacognition, data were analyzed to know how students were strong at competencies in specifying goals, process monitoring, monitoring clarity, and monitoring accuracy. Findings revealed that the students took increasing competencies in these terms defined as process of self-learning monitoring. This reflected that the students learned to monitor their own learning. Concerning self-system, it was required to examine students' motivation toward new tasks or learning in terms of examining importance, examining efficacy, and examining emotional response defined as individual-inner-directed. Findings revealed that these sets of mental process were supported.

For the fifth assessment, data were based on the posttest of both unit tests and learning achievement test. This analysis was to indicate if the curriculum developed was effective. The result revealed that the curriculum was effective (E_1/E_2) at an effectiveness index score of 82.00/81.50. This was higher than the established score (80/80). Considering the students' satisfaction toward the curriculum, it showed that the students were highly satisfied with learning from the curriculum.

The students' competency in speaking and writing were also reported. According to speaking skill, data were collected from classroom observation, discussing tasks, and oral communication among / between students and teacher. The analysis showed that the students developed their oral skills in English in a meaningful manner. The most outstanding performance was word uses. Language structure and fluency were found that they were gradually developed. For competency in writing, data were elicited from writing tasks. Analysis represented that it was remarkable in meaning rather than grammatical correctness. However, key words in sentences were seldom lost. Spelling showed sound evidence. Additionally, Handwriting was admirable performance.

DISCUSSION

Traveling into Marzano's Taxonomy, it was found that the taxonomy provided an interesting framework that offered the area where the two concepts, mental processing and types of knowledge, met. This new dimension was as a reason why Marzano's taxonomy was used as a framework in this study. Besides, this study made Marzano's taxonomy marry content-based instruction (CBI). This was aimed to see the effectiveness of this joint area relating to the habits of mind in managing knowledge or contents delivered.

The study showed that the availability of such a curriculum utilized for enhancing students' competencies in both English skills and academic content. This was evident from findings that were positive regarding learning achievement in both English competency and academic content. For the progress of practical English skills, speaking and writing, creative dimensions relating to challenging activities or tasks, interesting contents, and the varieties of materials invited the learners to put their efforts on practices. For self-system, the study found that the learners were highly motivated. This was that the framework used introduced a conditional area where motivation exists. Metacognitive was found to be positive also. Starting with clear and shared goals stimulated the learners to monitor the ways to goals.

These positive results hold the credit in which developing curriculum was systematical facilitated by the Taxonomy. Additionally, the curriculum and its materials went for their progress according to the experts' suggestions.

Used as a framework, the study found that Marzano's taxonomy was able to facilitate curriculum development in terms of classifying educational objectives, designing learning activities or tasks and assessments, known as key components.

Considering the influence of Marzano's taxonomy toward curriculum development, it hold the greatest hope for significantly improving student achievement including

problem solving. This was evident from some studies. Based on analysis of problems in learning Introductory Physics Course at George Washington University, Teodorescu (2009) considered that an appropriate taxonomy was required to solve the problems. Hence some criteria used for selecting taxonomy were specified. These included four lists that were: 1) *to include the problem-solving process in the list of its cognitive processes*, 2) *to describe the problem-solving process in terms of component processes*, 3) *to make clear distinction between the cognitive processes and the knowledge involved in problem solving*, and 4) *to list cognitive processes and knowledge domains that have also been identified by physics education research as relevant for physics problem solving*. Teodorescu found that Marzano's taxonomy was fit to these criteria. The taxonomy was employed for designing and clarifying educational objectives, for developing assessments, and for guiding curriculum design. Accompanying with developing curriculum, didactic tools were designed based on the taxonomy as well. According to curriculum implementation, it results featured improvements in students' problem-solving abilities and in their attitudes towards learning physics.

As its acceptance in providing series of hierarchical learning process or goals, the taxonomy was used as a tool for following up classroom curriculum implementation. If classroom curriculum implementation was effective, three systems of thoughts offered by the taxonomy were expected to find via learning tasks or activities. This premise appeared in the study conducted by Cleavinger (2009). According to this study, teachers' behaviors relating to administering the curriculum to the class were observed. Observations were used to determine if the implementation of the curriculum called *Visual Quantum Mechanics (VQM)* provided for the students of Kansas State University (KSU) yielded effectiveness reflecting through teachers' instructional strategies. Regarding teachers' instructional strategies, they were expected to be coherent to the three systems of thoughts in which the learning process generally started with self system, went through the metacognitive system, proceeded through the cognitive system and finished in the knowledge domain, according to Marzano (Cleavinger, 2009).

Providing curriculum aimed to develop English skills and thinking skills has increased its attention at present. Language and thinking are considered that they are closely related. Like the present study, Meei-Ling Liaw conducted the study that was designed to examine the feasibility of promoting critical thinking skills in an EFL classroom for junior high school in Taiwan. This study used taxonomy and CBI as theoretical frameworks for designing learning objectives and tasks. Based on the theoretical frameworks, the topics and instructional materials were: (1) *The Fox and the Crow* from *Aesop's Fables*; (2) *The Frog's Life Cycle* and *Frogs*; (3) problem solving and math problems from *Scholastic Explains*

Math Homework; and (4) a simplified version of *Tuck Everlasting* (Liaw, 2007). Findings revealed that the students performed significantly better on their English language proficiency test after the project. The end-of-project questionnaire indicated positive responses toward the instructional approach. The students believed that they had gained much in subject area knowledge, thinking skills, English language ability, and most important of all, confidence and motivation to learn all assigned. The study indicated that the implementation of the CBI for thinking skills might not only have helped the participants to develop their English language skills, but also their thinking skills (Liaw, 2007).

Conclusion

This study traced the labyrinth of curriculum development providing students' engagement in the relationship between academic contents and language skills that have been the neglected areas at current investigations. To be creative and overcome this complicated area, the study used Marzano's taxonomy as a framework for designing educational objectives, assessments, and tasks. It also used CBI, a teaching approach, to support the premises in which learning English through different subject areas was more effective and interesting.

The study suggested that the theoretical frameworks adhered facilitated the alignment in order for harmony and balance in curriculum development. With a balanced architecture of the curriculum, the study showed that the curriculum developed supported students to access colorful contents and new experiences in English skills. Additionally, for further investigation, the study opened a starting point on how to develop a curriculum so that students can attain learning goals in both academic contents and language skills guided by Marzano's taxonomy and CBI.

Suggestions

Based on experiences found from implementing this study, suggestion that the author would like to express first is assessment relating to Metacognitive and Self-System. Assessment of these two mental processes should be subjective. This makes students express their feelings freely and gives profound answers. Therefore, assessment tools should be open-ended questions. Next, providing of contents including language experiences, as inputs, should be punctilious in terms of length and difficulty. Finally, classroom contexts should be monitored for readiness before presenting contents to students.

REFERENCES

Bragger JD, Rice DB (1999). The message is the medium: A new paradigm for content-oriented instruction. *Foreign Lang. Ann.* 32:371-391.

- Brinton DM, Snow MA, Wesche MB (1989). *Content-based Second Language Instruction*. Boston, Heinle & Heinle.
- Brinton DM, Snow MA, Wesche MB (2003). *Content-based Second Language Instruction* (Michigan Classic Edition). Ann Arbor, The University of Michigan Press.
- Bueno KA (2002). Creating community and making connections in a third-year Spanish course: A content-based approach. *Foreign Lang. Ann.* 35:333-341.
- Cleavinger L (2009). *The Effect of Professional Development on Instructional Strategies and the Resulting Influences on Student Learning for a Physics Curriculum*. Kansas State University Ph.D. Dissertation.
- Dupuy BC (2000). Content-based instruction: Can it help ease the transition from beginning to advanced foreign language classes. *Foreign Lang. Ann.* 33:205-223.
- George JW (2009). Classical curriculum design. *Arts Humanit. High Educ.* 8(2):160-179.
- Hoecherl-Alden G (2000). Turning professional: Content-based communication and the evolution of cross-cultural language curriculum. *Foreign Lang. Ann.* 33:614-621.
- Howell KW, Nolet V (2000). *Curriculum- based Evaluation: Teaching and Decision Making*. 3rd ed. CA, Wadsworth.
- Krashen SD (1985a). *Input in Second Language Acquisition*. Oxford, Pergamon Press.
- Krashen SD (1985b). *The Input Hypothesis: Issues and Implications*. New York, Longman Press.
- Krathwohl, DR (2002). A revision of Bloom's Taxonomy. *TIP.* 41(4):212-218.
- Kwangsawad T (2005). *Handbook of English Teaching*. Mahasarakham, Mahasarakham University.
- Liaw ML (2007). Content-based reading and writing for critical thinking skills in an EFL context. *ETL.* 31(2):45-87.
- Lyster R (2007). *Learning and Teaching Language Through Content: A Counterbalance Approach*. Amsterdam, John Benjamins.
- Marzano RJ, Kendall JS (2008). *Designing & Assessing Educational Objectives: Applying the New Taxonomy*. Thousand Oaks, Corwin Press.
- Ministry of Education (2008). *The Basic Education Core Curriculum B.E. 2551 (A.D. 2008)*. Bangkok, The Agricultural Co-operative Foundation of Thailand Ltd.
- Moeller AJ (1994). Content-based foreign language instruction in middle school: An experiential learning approach. *Foreign Lang. Ann.* 27:535-544.
- Peck S (1987). Spanish for social workers: An intermediate-level communicative course with content lectures. *Mod. Lang. J.* 71(4):402-409.
- Schwab JJ (1969). *The Practical: A Language for Curriculum*. School Review (Summer).
- Snow A, Brinton D (1988). *The Adjunct Model of Language Instruction: Integrating Language and Content at the University* (Technical Report 8). Los Angeles, Center for Language Education and Research, University of California.
- Squires DA (2005). *Aligning and Balancing the Standards-Based Curriculum*. Thousand Oaks, California, Corwin Press.
- Stryker SB, Leaver BL (1997). Content-based instruction: From theory to practice. In *Content-Based Instruction in Foreign Language Instruction: Models and Methods*. ed Stryker SB, Leaver BL, Washington, DC.: Georgetown University Press, pp.2-29.
- Teodorescu RE (2009). *Cognitive Development in Introductory Physics: A Research-based Approach to Curriculum Reform*. George Washington University Ph.D. Dissertation.
- Welch WW (1969). Curriculum evaluation. *Rev. Educ. Res.* 39(4):429-443.
- Wongyai W (1994). *Curriculum Development Process and Teaching & Learning in Practices*. Bangkok, Suviriyasarn (in Thai).
- Zais RS (1976). *Curriculum: Principles and Foundations*. New York, Harper & Row, Publishers, Inc.