

Application of Multiple Intelligences Theory in a Korean Elementary School¹⁾

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I. Introduction

A serious predicament of the Korean education system is its inability to provide individual students with a structured and systematic opportunity to identify and develop their special abilities. Plagued with curriculum and assessment policies which force students to cram simple facts by rote, the education system has rather impaired the realization of individuality, uniqueness, and creativity. For instance, based on the overwhelming emphasis on linguistic and logical-mathematical abilities, the education system often abandons students with other talents as "lost causes" and chokes other performance abilities from flourishing.

Fortunately, "the 7th Curriculum Development" offers hope that such an educational reality could be amended in the near future. Aiming to improve the quality of education, it pursues to develop a more individualized and diverse curriculum for Korean schools.

This research shares the same urgent purpose : i.e. to develop curriculum which stimulate the multiple intelligences areas of the human mind and to present an alternative education system which identifies and fosters the strong intelligence areas of individuals early on. For example, an apprenticeship-like education would produce adults with execution abilities sufficient to perform their vocations. This research has developed and implemented integrating curriculum based on Howard Gardner's Multiple Intelligences (hereinafter MI)²⁾ Theory to study the theory's effect and implications to Korean education.

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- 1) The authors wish to acknowledge the Korea Research Foundation for its financial support in the program year 1996.
They also extend deep gratitude to Dr. Howard Gardner and Mara Krechevsky for their indispensable contribution to this study.
- 2) According to MI Theory, the human intelligence comprises 8 areas : 1) Linguistic Intelligence, 2) Logical-Mathematical Intelligence, 3) Musical Intelligence, 4) Spatial Intelligence, 5) Bodily-Kinesthetic Intelligence, 6) Interpersonal Intelligence, 7) Intrapersonal Intelligence, and 8) Naturalistic Intelligence.

MI Theory defines intelligence as an ability “to solve problems” or “to fashion products that are valued within one's culture” and divides the human intelligence into eight areas. According to MI Theory, first, all human beings possess eight unique intelligences which are autonomous in relation to each other. Since the eight areas are relatively independent from each other, one area cannot be a basis of correctly predicting another. Second, MI Theory emphasizes that all eight intelligences are equal and points out that it is false to claim only the linguistic and logical intelligences as components of “smartness” while regarding other intelligences as mere “talent.”

To understand what possibilities this new interpretation of intelligence holds for Korea, this research has applied it to the Korean classroom. The input, process, and output of this case study, we, the authors hope, will serve as a helpful guide to applying new theories in the field.

II. Multiple Intelligences Theory and Curriculum

MI Theory's basic principle that the human mind holds multiple intelligences³⁾ in turn implies that each and every human being possesses the potential of developing these eight areas of intelligence. Under MI Theory, even though all human beings develop their intelligences to some extent, no two person share an identical intelligence profile. The theory goes on to claim that different cultures regard different abilities as intelligences.

The essence of MI Theory is the independence and equality among each area of intelligence. An example of this independence would be a genius who by far excels in one area while being definitely inferior in another. By claiming equality among the intelligences, MI Theory places the same importance on bodily-kinesthetic intelligences as on linguistic or logical-mathematical intelligences, which were traditionally emphasized in IQ tests.

Gardner's MI Theory expands the horizon on human intellectual abilities and calls for a new method of educating and assessing students. A curriculum based on MI Theory includes activities designed to develop spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal and naturalistic intelligences as well as the traditionally valued ones. The advantage of this approach is the ability to provide education that not only realizes

3) Kagan & Kogan (1970) and Sternberg (1984) also shared similar views regarding intelligence.

one's potential but also supports social demands and values. MI Theory implies a curriculum integration centering around the intellectual abilities valued by the society rather than individual subjects (Young-man Lee, 1996). Furthermore, a curriculum based on MI Theory could continuously reinforce a student's strength while using concepts and symbols related with one's stronger area of intelligence to supplement and improve a less developed one. (Myung-Hee Kim and others, 1998)

MI Theory believes in "Teaching for Understanding." Gardner stipulates that understanding becomes clear only when students are able to use acquired concepts or knowledge to fashion results. To Gardner, understanding is the ability to appropriately apply the knowledge, concepts, and skills acquired in a certain educational setting to a new setting or circumstance.

Therefore, performance assessment is required to guarantee "Teaching for Understanding." However, to successfully capture the multiple areas of intelligence, the traditional paper-and-pencil tests are no longer appropriate. A more precise and broader scope of assessment which takes into account the creation process as well as the resulting products is required. A Multiple Intelligences classroom uses portfolios, songs, art works, video tapes of project activities as new assessment instruments. Gardner believes that by observing how students manipulate symbols of each intelligence area one could best assess their intellectual weaknesses and strengths.

III. Methods

1) Process

Research Subject and Period

For the purpose of developing and implementing integrated curriculum based on MI Theory to identify its educational effect and implications, an elementary school in Seoul was selected in 1996. The research was limited to the first and second graders of this elementary school, which was affiliated with a university. The research was conducted from December 1996 to December 1998. Accounting for the time for preparation, the actual research spans over a 3 year period.

Participation

Cooperation of three institutions was essential. The Institute for Educational Research^{h4)} at Hanyang University led the research team, which also included the teachers of the

subject elementary school⁵⁾. Harvard Project Zero's⁶⁾ co-director, Dr. Gardner and Senior Researcher Mara Krechevsky participated as advisors.

Major Activities

A. Major Activities

Date		Description
Sep. 1996 - Dec. 1996	Pilot Study	Sep. 23, 1996 : First Teachers' Workshop * Content: MI Theory Introduction/Examples/Teaching activities per intelligence/integrated scenario example Meeting between teachers and research team
March 17, 1997		Second Workshop: Curriculum Development based on MI Theory
May 19, 1997		Third Workshop: "Three Dimensional MI Naturalistic Assessment " ? Develop a learner-oriented assessment instrument to help to realize the potential ability of elementary school students
July 14, 1997	Workshop	'Forum for Project Hanyang " Introduction of study attempting to connect MI Theory and Korean education, briefing on research status, questions and discussion, encourage active participation of researchers
September 9, 1997		Cooperative Learning
March 23, 1998		Fourth Workshop: 'Developing Effective Teaching Activities in MI Education " ? Learning activities and assessment instruments for each intelligence; project, portfolio and rubric
September 2, 1998		Fifth Workshop: 'Curriculum Development based on MI Theory " Overall MI Theory review and supplementation/Refine developed scenario

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- 4) Hanyang University's the Institute for Educational Research, founded in 1975, aims to identify problems of the nation's school education and to present solutions by introducing and applying advanced education theories to Korea's education research. With the support from numerous advisors and researchers, the institute started to develop since 1996, curriculum for Korean Elementary Schools based on MI Theory.
 - 5) The subject elementary school, founded in 1966 in the spirit of Teaching Love, has implemented various teaching formats and open education programs. It provides an environment in which students are encouraged to solve problems on their own. Hanyang Elementary School's participation in this MI Theory research will present the possibility of developing a practical curriculum for education reform.
 - 6) Harvard Project Zero, opened by Nelson Goodman in 1967, has developed programs for teaching and assessment with the purpose of learning human development. During the past two decades, more than 100 researchers have participated in its activities. It has contributed greatly to the various aspects of humanities and social sciences.

As shown above, a pilot study was conducted to improve the study's quality. In addition, a series of workshops were held to train the teachers, the actual deliverers of the education. Principals and education experts were also invited to the workshops, which provided a basis for sincere cooperation in research.

B. Curriculum Development Process

Based on the input from the pilot study and a series of workshops, a curriculum for applying MI Theory in a Korean classroom gradually started to emerged. Following the pilot study in the second half of 1996, an integrating curriculum was developed under the theme "Seasons." While the content of existing textbooks was still the basis, the curriculum integrated all subjects taught in the first and second grades based on the four sub-themes of "Spring," "Summer," "Autumn," and "Winter."

1. In the course of reviewing 1997's curriculum implementation, the research team came to realize that the theme's generative power was too limited. Through a detail analysis of textbook content and a series of discussions with field teachers, a new theme was selected. The theme for the 1998 curriculum was "Us," which comprised sub-themes of "Change," "Nature," "Travel," and "Reflective Thoughts."

Each sub-theme was then developed even further. For example, the sub-theme "Change" was broken down to "Change of Time," "The Concept of Change," "Changes in Spring," "Changes of the Seasons," "Changes of Syllables," and "Changes of Numbers." "Nature," another sub-theme, developed into "The Concept of Nature," "The Human Body," "Creating Shapes of Natural Symmetry," "Grocery Market," "Conserving Nature," and "The Nature in Summer." The sub-theme "Travel" included "Project Travel," "A Trip in Autumn," "Travel Newspaper," "Travel through Puppet Theatre," and "Imaginative Journey Through Old Tales." Lastly, "Reflective Thoughts" branched into "Reflection on Friends," "Reflection on School," "Reflection on Environment," and "Reflection on Myself."

In 1998, this new theme structure was applied to conduct appropriate teaching-learning activities embodying multiple intelligences theory. A search for new assessment methods that would give accurate insight to student abilities also started in the first half of 1998. Instead of depending solely on teacher input, the new methods valued assessments by students (peer assessment, self-assessment) and by parents as well. A "Student Development Assessment Card" came to replace the traditional report card.

Through a long term research effort spanning almost 3 years, an integrating curriculum based on MI Theory was developed and applied. However, further research

must follow to guarantee the successful application of MI Theory to Korean education.

2) Method

While a variety of studies were conducted during the research period, five studies are particularly noteworthy for highlighting MI Theory's various intelligences. "Character Education" emphasized the interpersonal and intrapersonal intelligences. Another curriculum applied the "ARTS PROPEL" principles to its activity design and assessment. The "Art Project" focused on developing and assessing the spatial intelligence while the "Project Approach" aimed to develop meta-cognition. Also significant was the "Writing Curriculum Integration" which used writing as a means of curriculum integration.

The four main approaches used in these five studies are content analysis, in-depth interview, participant observation, and video taping. Considering that the study was conducted in the actual classroom, a qualitative approach was favored. The application of diverse research methods was a process of establishing validation for the research.

Content Analysis

The content of various materials was analyzed to better understand the research intention. Materials analyzed included textbooks, lesson scenarios based on textbooks, exercise sheets and assessments (rubric and reflection log). While the level of analysis was general, teachers and researchers cooperated in the analysis.

Participant Observation

To gain a deeper understanding of the classroom situation, researchers sat in the classroom to observe how lessons were conducted. The observations were non-interventional(on-looker's view), open, and repetitive.

Video Taping

Researchers and teachers consulted each other in determining whether to video tape classes. Therefore, observation time, frequency, and content showed slight differences. The video tapes played a supplementary role to participation observation and scenario content analysis.

In-depth Interview

In-depth interviews are formal interviews conducted according to a pre-defined interview schedule. The interviewees consented to be interviewed in advance and agreed

to a certain interview time and place. Five teachers and 15 students were interviewed.

III. Results

Among the various research tasks conducted during the research period, this chapter discusses examples of teaching-learning activities which highlight the unique features of MI Theory by emphasizing a specific area of intelligence. The five studies offering noteworthy insight are 1) "Character Education" emphasizing interpersonal and intrapersonal intelligences; 2) curriculum and assessment applying "ARTS PROPEL;" 3) "The Art Project" focusing on spatial intelligence; 4) "Project Approach" to develop meta-cognition, and 5) "Writing Curriculum Integration" with a focus on writing.

The research process, characteristics as well as the results and implications of these five studies, are as follows.

1. Integrating Curriculum using Character Education

- ability to understand oneself and others -

Among the eight intelligences, the interpersonal and intrapersonal intelligences are generally referred to as personal intelligences. The personal intelligences are related with affective domain development and address the character building aspect of school education that teaches students the values of cooperation, respect for others, self-understanding, and positive thinking and self-esteem. According to Gardner, interpersonal and intrapersonal intelligences are deeply connected with a person's emotional ability and are valuable strengths in coping with life's many adversities.

The study qualitatively analyzed the effects of teaching-learning activities designed to develop personal intelligences by documenting the types of developmental tendencies students demonstrated in the actual class setting.

1) Process

A. Research Subjects and Period

The study was conducted with two classes in the first grade during a 6 month period from September 9, 1997 to February 28, 1998.

B. Instructional Design

The scenario included a wide variety of activities designed to “develop intelligences,” “enhance problem solving abilities,” and “stimulate interest.” A total of 17 class hours⁷⁾ of lessons were conducted under such themes as “Autumn (8 class hours)”, “Winter (4 class hours)”, “Old Tales (1 class hour),” and “At the End of First Grade (4 class hours).”

Teaching-learning activities prepared to strengthen interpersonal intelligence class include activities using jigsaw models, small group level research and presentations, group rule definition, tale making, interpersonal relationship checklisting, making class projects, and observing and recording classmate actions. Teaching-learning activities designed to enhance intrapersonal intelligence included a self-reflective log and intrapersonal checklist keeping, goal setting & selection, identifying strong and weak points through group praising.

2) Research Result

Students who experienced teaching-learning activities designed to promote interpersonal and intrapersonal intelligences demonstrated development of abilities that could be categorized into “enhanced ability to consider and understand others” and “enhanced ability to understand oneself through reflective thinking”.

A. Ability to consider and understand others

Learning based on personal intelligence uses a basic learning structure which triggers interaction among classmates. In the course of naturally experiencing social interaction, students learn to understand and be considerate of each other. Once aware that classmates could hold different thoughts and therefore express them in different ways, students were able to perform tasks while listening to and respecting others' opinions. Especially noteworthy is the change in attitude towards under-achieving students. Some students that had previous negatively regarded classmates with seemingly weaker cognitive abilities came to forge mutually contributing relationships with them, resulting in a positive attitude.

B. Reflective thinking

Activities which help students recognize their strong and weak points or activities designed to make students plan, execute, and reflect on their actions were shown to build stronger self-understanding by enhancing thinking abilities and by instilling positive self-images. Positive interaction between teachers and students, positive

7) In this research, one class hour refers to 120 to 140 minutes.

assessment of student ability, teacher's positive feedback regarding activities selected by students were shown to improve self-esteem, which is a significant educational outcome.

3) Implication

The development and implementation of teaching-learning activities based on personal intelligences provides meaningful contrast to the current education program preoccupied with delivering mere facts. It also gives practical direction to developing a balanced curriculum capable of enhancing the affective domain.

Activities designed to build personal intelligences such as the abilities to understand and consider others or to reflect upon oneself not only contribute to greater self-esteem but also coincide with education's ultimate goal of developing democratic citizens with the sense of mutual recognition, responsibility, and cooperation. Therefore, the significance of this study is with the potential of developing members of society demanded by the next millenium.

2. Curriculum and Assessment based on ARTS PROPEL

ARTS PROPEL⁸⁾ provides assessment instruments for art education diagnosis for upper grade elementary school students and highschool students. The three abilities measured are “**production**” (composition and performance of music, drawing and coloring in fine arts, creative and imaginative writing), “**perception**” (uniqueness within the art form or ability to think artistically) and “**reflection**” (ability to understand one's sensibility or the purpose, methods, difficulties and effects of art works).

However, diagnosis of artistic ability is, realistically speaking, impossible within the short time frame adopted by existing test tools. Accordingly, this study was designed to review student's abilities or potential within a longer time span. “Domain Projects”⁹⁾ and “Propel Portfolios”¹⁰⁾ were applied for this purpose.

8) ARTS PROPEL, sponsored by the Rockefeller Foundation, is a cooperative study conducted through joint effort of Harvard Project Zero, ETS, teachers, and administrators of Pittsburgh public schools with the goal of using art to enhance thinking abilities.

9) This refers to a long-term open project with the purpose of assisting in-depth understanding through art. The process as well as the results are valued. Assessments include self-assessment and peer assessment in addition to student assessment.

10) The Propel Portfolio, also referred to as a processfolio, collects not only finished works but also first drafts, progress notes, sketches and all other records of the learning process. Final works including a reflection note and student profiles, are created through multi-dimensional assessment.

1) Process**A. Development of an Art Curriculum Model**

Based on the theoretical framework of ARTS PROPEL, this study developed an art curriculum and assessment method for the first and second grade elementary school students. The curriculum and assessment focused on using the area of fine arts to develop creativity and thinking abilities. In other words, the emphasis was placed on not just drawing techniques but on the ability to understand object artistically, the ability to appreciate the works of others and the ability to reflect upon one's own works.

B. Assessment

ARTS PROPEL does not distinguish curriculum from assessment. It believes that assessment is another learning experience for students. To maximize the learning effect of assessment, ARTS PROPEL keeps portfolios of all works and results generated during class. The portfolios indicate which tasks or abilities were emphasized to each student and provides a basis for assessment in the form of rubrics¹¹⁾.

During this study, students assessed not only themselves but also others in the class. The advice and comments made to oneself or received from others helped students identify and correct their weaknesses.

C. Activities

Activities consisted of drawing animals, plants, and movement as well as appreciating the works of renown painters and expressing one's impressions. First and second grade elementary school students were asked to talk about impressions after watching both concrete and abstract art. The study was conducted during a 2 month period from the second week of May 1998 to Mid July.

2) Result and Implication

First and second graders demonstrated sensitivity to visual symbols and reactions. Since their ability of written expression is yet limited, they reacted especially sensitive to pictures and other visual symbols. A new curriculum based on such fine arts activities

11) Rubric originates from the latin word for red. In ancient times, legal or ceremonial authorities wrote explanatory comments in red. In other words, a rubric explains the process of fairly judging a given situation based on law. (Wiggins, 1996) To be more specific, rubric, in this context, refers to an assessment tool designed to rank and grade the performance of various students by listing and evaluation them according to a given set of rules.

reaped the following results.

First, multi-dimensional assessment was possible. A curriculum based on ARTS PROPEL requires self-assessment, peer assessment, teacher assessment, and parent assessment simultaneously. Such an approach enables a more accurate assessment of a student's true ability and a multi-dimensional understanding of a student's performance capabilities. Second, participation of both students and teachers provided the basis for a true rubric, which included "acquisition of content and basic function," "learning progress," "creativity," "understanding of surrounding environment and materials," "reflection," "organizing ability," "linguistic ability," and others. Third, through a reflective process including self-assessment and peer assessment, students showed improvements in such affective domain abilities as "cooperation." In particular, self-reflection on fine arts activities led to considerable enhancement of writing capabilities. The study, which focused on spatial intelligence, presents the possibility that development of spatial intelligence may not be limited to realizing the potential of just that intelligence but might also trigger the development of other intelligences as well.

3. Art Project : focus on spatial intelligence

Project learning is an extremely effective method in applying MI Theory to education, and fine arts is one of the favorite subjects of elementary school students. Accordingly, the Art Project combines these two aspects to create a project learning program which uses various spatial intelligence activities to enhance the students' "creativity" and "reflective capabilities."

The theme for the project was "We Are A Part of this Beautiful World." Within this theme students were allowed to freely select a specific theme for their group's activities. In other words, the Art Project is a project designed for first and second graders with a focus on spatial intelligence.

1) Process

A. Research Subjects and Period

One class from the first grade was selected for the study, which was conducted during a 9 week period spanning from the first week of October 1998 to the second week of December the same year.

B. Preparation for Group Projects

Considering that the subjects were the first graders, the appropriate group size was set at six to seven. Each student's gender and abilities were carefully considered to create groups of even distribution. In addition, roles within the group were clearly defined, which provided a framework for cooperative learning. For example, the student in charge of writing was designated as the "writer" while those responsible for drawing became "artists," those in charge of collecting materials "directors" and students to give presentations were called the "announcers."

2) The Content

Class Hour	Major Activity	Description
1	Select Theme	Select theme>Select and sequence activities
2	Write Contract	Specify activity sequence and content/Each group writes a 'Project Contract '
3	Research by Group	Theme research/Paste related photo or pictures/Write about discovered facts
4	Define Project Concept	Each group defines project By agreeing on a project name, the group shares a common purpose
5	Field Study	Conduct field study by group and write report (pictures or photo)
6-9	Select Activity Stage and Organization	Each group selects activity Share reason for the activity and sequence (reflection process after activity)
10	Prepare Presentation	Create 'Project Portfolio' (title, cover page, table of contents, activity name and content etc.) Plan for presentation (decide presenter, method, and detail content; build props if necessary)
11	Assessment	Reflection on project planning and implementation (overall performance assessment) Plan for future projects
12	Present	Present project to others

3) Result and Implication

The Art Project revealed various effects in terms of both intellectual as well as affective domains. First, the "project log" was shown to improve reflective as well as critical thinking abilities. The art activities enhanced creative thinking. Next, in terms of the affective domain, students acquired a higher level of self-esteem, cooperative learning culture, motivation to study, and a culture of discussion, which led to a greater awareness of others. In particular, as indicated by the theme and project names¹²⁾, the

Art Project also succeeded in imbedding traditional sensibilities to the students in a natural manner.

4. Project Approach

Projects are a form of learning where students plan and implement a set of activities with the goal of converting their thoughts into a concrete reality.

1) Process

A. Subjects and Period

One class from the second grade was selected for the study, which was conducted over a three month period from September 1, 1998 to December 10 of the same year.

B. Process and Tasks

Project learning was conducted in three steps: planning (select theme, planning with a goal), implementation (conduct activities, assess) and presentation. First, teachers presented "change" as the integrating theme. Then, the students formed 11 groups, which were allowed to select a sub-theme of interest. Plans were established and implemented and the final presentation completed the steps.

The sub-themes selected by some of the groups included changes in transportation means, changes as we grow up, changes in the biosystem, and changes in flowers just to name a few.

2) Result and Implication

Project learning revealed meta-cognitive abilities in the students. In other words, students were found to evenly use development skills, academic self-concept with an awareness of one's own abilities, trust of others, ability to recognize the degree of difficulty of the situation or problem, general strategy knowledge, and specific strategy knowledge. Through continuous observation, it was confirmed that the students had used comprehensive meta-cognitive abilities to plan, seek information, self-monitor, comprehend, revise, and execute control.

The results also supported the effectiveness of project learning. Students were

12) Research themes (project names) selected by the student groups included Traditional Korean Attire (KoKaot), Korean Artists (Kim Hung Do), Korean Ceramics (Bunchunsagi), Cartoons (The Fairy and the limberjack), Korean Flowers (Halmigot) and the Universe (The Sun and the Moon)

observed to better identify which of the eight areas of intelligences were their stronger ones through project learning, since roles within a group were divided according to perceived strong intelligence area of the members. Overall, the continuous presentation and group activities were shown to have improved the speaking abilities and interpersonal intelligence of most students.

5. Writing Curriculum Integration

Since a linguistic society preserves its experience and knowledge in the form of writing, the importance of writing increases as communication through writing expands. While the current education system emphasizes writing skill or “continuous training of lower level strategies,” it has neglected the function of writing which enables one to identify specific contexts or situations.

The Writing Curriculum Integration is based on an idea of applying writing as a functional means of integration across all academic subjects to provide MI Theory based education. Considering that the subjects were first graders, the writing curriculum based on MI Theory incorporated a wide variety of learning tasks and activities. In other words, to address the need for an integrating curriculum to make school life more interesting for these first graders, a Writing Curriculum Integration based on MI Theory was developed and applied.

1) Subjects and Process

A. Subjects and Period

One class from the first grade was selected for the study, which lasted for a total of 3 months from September 19, 1998 to December 15, 1998.

B. Instructional Design

The Writing Curriculum Integration referred to Forgarty's Tandem model, which is a link between the “webbed” and “threads” models. Subsequently, “traveling” and “reflections” were selected as themes, and linked to various writing activities.

Under the theme “Traveling”, five class hours of scenarios were developed including “Autumn Journey,” “A Musical Journey,” “Travel Newspaper,” “Travels Through Tales-I,” “Travels Through Tales-II.” The theme “Reflections” was used to develop four class hours of scenarios such as “Reflection on Friends,” “Reflection on the Environment,” “Reflection on the Community,” and “Reflection on Myself.” In total, the

Writing Curriculum Integration consisted of nine class hours.

2) Result and Implication

Based on MI Theory, the Writing Curriculum Integration was developed to address the limitations of existing writing education and to provide a writing across the curriculum which emphasizes functional aspects. The results of the study can be divided into cognitive and affective domains.

In terms of cognition, students experienced enhanced learning and understanding capabilities by writing down what they had learned. At the same time, the revising exercises which emphasized the process itself improved their writing abilities as well. In addition, "creativity" including fluency, flexibility, and precision was found enhanced. Second, in terms of affection, the variety of writing experiences triggered interest and interaction with classmates and enabled "cooperative leaning." Cooperative writing deepened student understanding of the need for mutual trust, respect, and cooperation. The process of "self-reflection" was an opportunity for each student to identify one's strong and weak points.

IV. Conclusion and Recommendations

The application of a relatively new theory to the classroom enabled the development of curriculum in the true sense and an analysis of their effects. Input in the form of new education theories or curriculum development was observed to lead to the next natural process of appropriate methods and plans, and ultimately flows out as output.

1. Conclusion

The five studies mentioned above could be summarized to bear the following implications regarding development and implementation of MI curriculum.

1) Improved Student Potential

First, students demonstrated enhancements in expressive power. The enhancements in linguistic and spatial abilities were quite evident since the subjects were the first or second graders. In terms of linguistic expression, the studies confirmed improvements in both written and oral presentation, logical development, sentence composition,

vocabulary, and spelling. Regarding spatial abilities, “acquisition of basic artistic skills (sense of form, color and spacial arrangement)” led to greater ability for artistic expression.

Second, stronger thinking abilities were also observed. Students showed improvements in creative writing, spatial composition, musical reproduction, knowledge of nature, and reflection abilities. In particular, project learning was found to have immense impact on these features. The improvements in the thinking process can be divided into critical and creative aspects. Through self-reflection and group reflection, students acquired the ability for critical thinking. At the same time, voluntary and proactive participation in class activities enhanced creative thinking, which enabled shifts to new mindsets. Exposed to a wide range of thinking activities, the students expressed intellectual curiosity and passion for learning.

Third, the discovery and realization of intrinsic self-potential led to a stronger sense of self-identity. By identifying intelligence areas of strength or activities one was good at, students became more confident and gained greater self-esteem. This reinforced sense of identity will act as an important guideline in deciding a major or profession and help form a sound set of vocational values.

Fourth, students became more considerate of others and came to assume a new perspectives. The wide range of cooperative and reflective activities enabled students to change a self-centered perspective to one more oriented toward others. Of course the shift does not imply a mode of thinking which follows others unconditionally but rather a perspective which enables accurate judgement regarding others and oneself.

2) Enhanced Teacher Professionalism

First, teachers also demonstrated a stronger sense of identity. Participating as curriculum designers and implementers, teachers acquired firm confidence in their roles. This self-confidence developed into a confidence regarding others, which enabled them to regard themselves as the active initiators of education.

Second, teachers gained a wide range of perspectives in assessing student ability. The existing education system in Korea simply ranked the students in terms of their academic performance. However, MI Theory enabled teachers to assume a new perspective regarding students. By assessing each individual's unique and original abilities, teachers expanded their perspective from one which simply ranked students for convenience to one which respects the individuality and diversity of the students.

Third, teacher professionalism improved. In the study, teachers became “teachers as researchers” through planning, executing, and assessing the classes. By joining in the

development of MI Theory curriculum, teachers worked as curriculum experts and gained greater ability of organizing various activities(knowledge, deduction, skill, learning outcomes, affective domains).

3) Multi-dimensional Assessment Tested

First, the new assessment methods used in the studies allowed a wider group of people to be directly involved in the assessment process. The existing assessment programs only gave teachers the opportunity to provide input. Under MI Education, teachers, students, and parents all provide different perspectives to assessment. In addition, since the assessments are made in a certain context, the assessment is more naturalistic.

Second, a variety of assessment methods were employed. Assessment methods included short answer types, verbal questions, essays, performance assessment, observation, and self-reporting. Compared to existing assessment programs, the assessment based on MI theory uses a wider variety of techniques.

Third, appropriate methods were used organize assessment information and materials. Visually presentable assessment materials were filed while affective domain assessment materials were prepared through observation and self-report in the interpersonal and intrapersonal intelligence areas.

Fourth, rubrics were created as a reference to fair assessment. Even though teachers were aware of the limitations of short answers or selective assessment tools, they were unable to present a realistic alternative. However, many teachers believe that performance assessment or portfolio assessment tools would enable far more sincere and accurate assessments.

2. Recommendations

The five multi-dimensional studies described above confirm the possibility of applying MI Theory to Korean education. In addition, the planning and implementation process of these studies itself presents significant implications for future field studies.

The 3-year research regarding MI Theory-based curriculum development and assessment enables a student-oriented education by assuming the equality and independence among multiple intelligences. Instead of ranking students in terms of only their linguistic and logical-mathematical abilities, this new perspective places students in "several lines" according to each area of intelligence. Under such an assessment system,

students will be able to avoid the “negative self-image” too often experienced in the current Korean education system and develop into successful and active learners.

In conclusion, in reforming curriculum of Korean elementary schools, MI Theory provides an alternative which changes the excessively competitive environment of today into one where all students are able to identify one's unique abilities and strength, where these abilities and strength are appreciated and encouraged and where such values as self-esteem, trust, and intellectual passion are delivered. These values would help young students already suffering from loss of self-esteem and confidence to recover a brighter self-image. Teaching based on MI Theory will contribute to creating a new school culture where no one fails and everyone becomes a winner.

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