A Study of Pratomsuksa 4 Students' Multiple Intelligences, Before and After Learning with Visual Art Learning Integration Package

การศึกษาความสามารถทางพหุปัญญาของนักเรียนชั้นประถมศึกษาปีที่ 4 ก่อนและหลังการเรียนรู้ด้วยชุดกิจกรรมทัศนศิลป์แบบบูรณาการ

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บทคัดย่อ

       การวิจัยครั้งนี้ มีจุดมุ่งหมายเพื่อศึกษา และเปรียบเทียบความสามารถทางพหุปัญญา 4 ด้าน คือ ความสามารถด้านภาษา ด้านมิติสัมพันธ์ ด้านตรรกะและคณิตศาสตร์ และด้านธรรมชาติวิทยาของนักเรียน กลุ่มตัวอย่างที่ใช้ในการศึกษา เป็นนักเรียนชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 1 ปีการศึกษา 2551 โรงเรียนประตูชัย สำนักงานเขตพื้นที่การศึกษาพระนครศรีอยุธยา เขต 1 จำนวน 185 คน โดยแบ่งนักเรียนตามระดับผลสัมฤทธิ์ทางการเรียนเฉลี่ยของนักเรียนทั้ง 8 กลุ่มสาระการเรียนรู้ ในปีการศึกษา 2550 เป็น 3 กลุ่ม คือ ผลสัมฤทธิ์ทางการเรียน ระดับ ดี และดีมาก พอใช้ และควรปรับปรุง จำนวน 78 คน 85 คน และ 22 คน ตามลำดับ เครื่องมือที่ใช้ในการศึกษา คือ แผนการจัดการเรียนรู้ชุดกิจกรรมทัศนศิลป์แบบบูรณาการ ชุดกิจกรรมทัศนศิลป์แบบบูรณาการ และแบบทดสอบชุดกิจกรรมทัศนศิลป์แบบบูรณาการ เพื่อประเมินความสามารถทางพหุปัญญา 4 ด้าน สถิติที่ใช้ได้แก่ ความถี่ ร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน สถิติทดสอบที (t – test) และการวิเคราะห์ความแปรปรวนทางเดียว (One – Way Analysis of Variance: ANOVA) ผลการวิจัยพบว่า

       1. หลังการศึกษาชุดกิจกรรมทัศนศิลป์แบบบูรณาการในภาพรวม นักเรียนทั้ง 3 กลุ่มผลสัมฤทธิ์ทางการเรียน มีความสามารถทางพหุปัญญาทั้ง 4 ด้านแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 (p < .01) ความสามารถทางพหุปัญญาทุกด้าน หลังการจัดการเรียนรู้สูงกว่าก่อนการจัดการเรียนรู้

       2. ผลการวิเคราะห์ข้อมูลเพื่อเปรียบเทียบความสามารถทางพหุปัญญาของนักเรียน โดยใช้ชุดกิจกรรมทัศนศิลป์แบบบูรณาการระหว่างกลุ่มผลสัมฤทธิ์ทางการเรียนในภาพรวมทุกด้าน เพื่อวิเคราะห์ความแปรปรวนด้านความสามารถทางพหุปัญญาของนักเรียนระหว่างกลุ่มทุกด้าน ต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 (p < .01)

       3. ผลการศึกษาข้อมูลรายคู่ นักเรียนกลุ่มผลสัมฤทธิ์ทางการเรียน ระดับดี และดีมาก มีความสามารถทางพหุปัญญาทั้ง 4 ด้านในภาพรวมสูงกว่า นักเรียนกลุ่มผลสัมฤทธิ์ทางการเรียน ระดับพอใช้ และควรปรับปรุง อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และนักเรียนระดับกลุ่มผลสัมฤทธิ์ทางการเรียน ระดับพอใช้ มีความสามารถทางพหุปัญญาในภาพรวมทุกด้านสูงกว่านักเรียนกลุ่มผลสัมฤทธิ์ทางการเรียน ควรปรับปรุง อย่างมีนัยสำคัญทางสถิติที่ระดับ .01

Abstract

       The objectives of this research are to study and compare students' four aspects of multiple intelligences namely linguistic intelligence, spatial intelligence, logic – mathematical intelligence, and naturalistic intelligence. The population of this research consists of 185 Pratomsuksa 4 students who were studying in the first semester at Pratoochai School, under Office of Phranakhon Si Ayutthaya Educational Area 1. The students were classified into three groups – excellent and good, fairly, and poor (the numbers

of the members of each group were 78, 85, and 22 respectively) – according to their learning achievement in 8 subject groups in the 2007 academic year. Integrated Visual Art Activities Set (IVAS), Integrated Visual Art Activities Set Plan (IVASP), Integrated Visual Art Activities Set Test (IVAST) evaluate students' four aspects of multiple intelligence were used in data collection. Frequency, percentage, mean, standard deviation, t – test, and one – way ANOVA comparison were used in data analysis.

The findings indicated that;

1.)After participating in Integrated Visual Art Activities Set Plan (IVASP), the students in all groups apparently possessed higher multiple intelligence in all aspects. It was also found that multiple intelligences in all aspects of the students in each group were different at the statistical significance level of 0.01

2.)According to the comparison analysis result with the visual art learning integration package to analyze deviation of overall multiple intelligence among each group, it was found that multiple intelligence in all aspects of the students in each groups was different at the statistical significance level of 0.01

3.)According to the paired study results, the students in the first group (excellent and good) possessed higher multiple intelligences in all aspects than those in the second (fairly) and third (poor) groups at the statistical significance level of 0.01. Meanwhile, the students in the second group apparently possessed higher multiple intelligences in all aspects than those in the third group at the statistical significance level of 0.01.

Introduction

To date, visual art learning is an activity that applies visual arts to support the students in their self – expression of appreciation in artistic quality. Their imagination will be enhanced to stimulate and develop fruitfulness their intellect by integrating it with their livings. Nevertheless, trends of current courses will be classified in groups of subject which cannot adequately support the learners to be a versatile person, to discover their potentiality and their multiple intelligences. Emphasis on certain aspect of individual knowledge will cause the lack of self – esteem, self – confidence, unhappiness, loss of imagination and creativity . Learning activity only focusing on stimulation of left hemisphere cannot simultaneously enhance visual art creativity which is capable of developing right hemisphere . Development of both hemispheres is thus occurred in an imbalance manner. Holistic development of brain can integrate all learning which will result in more perfect human resources as how well human can learn will very much depend on brain and nervous system as a basis for its perception

(Patchareewan Katekhanchan 2001:5 – 7) where the brain will act as a center for perception of memory and feeling. In particular, right brain is responsible for emotional perception, creative thinking and love and mercifulness while left brain will control over logical perception and analytical truth. Human ability will therefore depend on the co – function of both hemispheres which have to work in harmony in order to be able to systematically think and deal with the problem and also to listen to the other's view. By applying learning activity package as learning media for stimulating and increasing attentiveness, aptitude and multiple intelligences (Chanchai Itarasunanont 1995: 39) will make learning more livable and help fostering cognitive development of the learner as variety of learning media is applied to facilitate the learner to learn from direct experiences which are in accordance with the content and objective of each course and to effectively modify the learner's behavior. Chodok Kengkhetkit (2008: interviewing). Learning integration by multiple intelligences is a holistic learning process having learning method that can better stimulate the brain

than other methods as it requires the brain to simultaneously manage all information and then learn from thought, intellect and emotion all of which can facilitate human natural learning. This is in line with human quality development under the notion of Gardner (Yaowapa Dechakupta 2001: 15 – 19; refer to Gardner 1987, 1993, 1999), a psychologist from Harvard University, who has studied about the potential and aptitude of human under the Theory of Multiple intelligencers which relates to human intellect and brain function. Gardner (1987, 1993, 1999 as cited in Yaowapa Dechakupta) concluded that intellect is an individual bio – ability reflecting the integration of genetic factor and environmental factor. He also believed that intellect is a biopsychology which is a creator of source of human thought which will have effects on learning in each aspect. Generally, an individual holds multiple aspects of intellect depending on his/her capability and express such in various forms such as linguistic intelligence, spatial intelligence, logic/mathematical intelligence, bodily kinesthetic intelligence, musical intelligence, interpersonal intelligence, interposal intelligence, naturalist intelligence and affective domain. It is believed that although there are different levels of intellect, each individual can be developed. Therefore, development of learner's ability under the notion of multiple intelligences will enhance learning by stimulating perception of brain by taking into account variety of ability held by each individual. Integration of visual art learning is also one of learning activities that can facilitate learners in exploring, researching and trying different kinds of material to create the works by applying creativity and imagination including observing surrounding environment for the purpose of building self – confidence, hand – visual correlation to develop conceptualization (Ong – Karn In – Maphan (1983: 279 – 282))

The researcher has chosen to study the outcome of applying integrated visual art activities

set plan and multiple intelligences on four aspects, namely, linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence of Prathomsuksa 4 student as follows:

1. Linguistic intelligence means the ability to communicate native language and foreign language to express one's feeling and capability. Language ability is an intelligence which can be used freely by learning and/or expression.

2. Spatial intelligence means the ability to see the area and understand 3 – dimension picture, sensitivity to colour, line, space and 3 – dimension picture in one's work.

3. Logic – mathematical intelligence means the ability to understand the principle of cause and effect (Causal System) as the same manner as the scientists do and to process number, quantity and mathematical practices (add, minus, multiply and divide) as the same manner as the mathematicians do. This also includes sensitivity in noticing logical relationship, abstract thinking and speculative thinking (If – then). The methods to be used are differentiation, classification, presumption, conclusion and hypothesis formulation.

4. Naturalist Intelligence means the ability to notice the difference among natural objects such as plant and animal etc. including promptness for understanding other attributes of nature e.g. nature of soil or rock etc.

Development of four aspects of multiple intelligences is in line an approach to the development of intelligence learners proposed by the Office of the National Primary Education Commission. The office of the defines that to become an intelligent student, such has to show ability in observation, differentiation, comparison and classification of all surrounding environment, language ability, perception of value of number, understanding in environment and experiences, memorability, observation, problem solving, perception, language comprehension, comparison

of amount and number by observing surrounding environment.

The researcher has classified Prathomsuksa 4 student into 3 groups according to their learning achievement for the purpose of examining the outcome of differently application of visual art learning integration package and of developing suitable media for the learner to develop students' intelligence subject to the difference of their learning achievement which will help in teaching and learning assessment to be in accordance with development and to stimulate the student to use various aspects of their ability. This method will allow the learner to solve the problem or to participate in making decision which requires integration of thought and reason.

Research Objective

To comparatively study 4 aspects of multiple intelligences, namely, linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence of Prathomsuksa 4 students before and after learning by applying visual art learning integration package.

Research Significance

To enable us to understand multiple intelligences and differences of the outcome of learning by applying visual art learning integration package of Prathomsuksa 4 student. (differentiated by group of learning achievement). It will also be of benefit to the instructor to apply findings as a guideline for preparing learning activities that can successfully enhance four aspects of multiple intelligences of the student, namely, linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence.

Research Scope

Population

The population of this research consists of 344 Pratomsuksa 4 students who were studying in the first semester of academic year 2008 at Pratoochai School under the Office of Phranakhon Si Ayutthaya Educational Area 1.

Sample group

The sample group of this research consists of 185 Pratomsuksa 4 students who were studying in the first semester of academic year 2008 at Pratoochai School under the Office of Phranakhon Si Ayutthaya Educational Area 1. The size of sample group was designated and calculated by applying Taro Yamane's formula (Yamane. 1967: 87) with error at .05 and it was selected by Stratified Random Sampling.

Variables

1. independent variable: visual art learning integration package

2. dependent variables are 4 aspects of multiple intelligences 4 consisting of:

2.1 linguistic intelligence

2.2 spatial intelligence

2.3 logic – mathematical intelligence

2.4 naturalist intelligence

Research Hypothesis

4 Aspects of multiple intelligences comprising of linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence processed by Prathomsuksa 4 students after applying visual art learning integration package are higher and are different.

Research Methods

Population designation

The population of this research consists of 344 Pratomsuksa 4 students studying in the first semester of academic year 2008 at Pratoochai School within the Office of Phranakhon Si Ayutthaya Educational Area 1.

Sample group selection

Pratomsuksa 4 students studying in the first semester of academic year 2008 at Pratoochai School within the Office of Phranakhon Si Ayutthaya Educational Area 1. The amount of 185 subjects were selected and then were grouped by

learning achievement in 8 subject groups in the academic year 2007 into 3 groups, namely, excellent and good, fair and needed to improve for the amount of 78, 85 and 22 subjects, respectively. Size of sample group for each group was calculated by percentage ratio and Simple Random Sampling by drawing. Sizes of each sample group are as follows:

Sizes of populations and sample groups

Student	Popula-tion	Sample group
Excellent and good learning achievement	145	78
Fair learning achievement	158	85
Needed to improve learning achievement	41	22
total	344	185

The finding shows that from the total of 185 students, fair learning achievement group has the largest amount of student for the total of 85 or 45.90% and followed by good and excellent learning achievement group for 78 or 42.20% and needed to prove learning achievement group for 22 or 11.90%, respectively calculated by applying Taro Yamane's formula (Yamane. 1967: 87).

Research Tools

1. Visual art learning integration package plan

2. Visual art learning integration package consisting of:

1) Package 1 Subject: crating works from crayon

2) Package 2 Subject: creating 3 – dimension geometric shape by clay

3) Package 3 Subject: printing by plant leaves   4) Package 4 Subject: elephant shape origami

5) Package 5 Subject: sticking seeds

6) Package 6 Subject: weaving "Ta Pien" fish from palm or coconut leaves

3. Pre – constructed questionnaires for visual art learning integration package to assess 4 aspects of multiple intelligences:

Volume 1 Pre – constructed questionnaire for assessing linguistic intelligence 15 items

Volume 2 Pre – constructed questionnaire for assessing spatial intelligence 15 items

Volume 3 Pre – constructed questionnaire for assessing naturalist intelligence 15 items

Volume 4 Pre – constructed questionnaire for assessing logic – mathematical intelligence 15 items

Experimental Design and Procedures

This study is an experimental research where the researcher has followed One – Group Pretest – Posttest Design.

The experimental period took place for 6 weeks by performing Pretest against the three groups by applying questionnaires to assess four aspects of multiple intelligences and then carrying out Posttest by the same questionnaire. Data was analyzed by statistical methods.

Data Processing and Data Analysis

For general information of the sample group, frequency and percentage were applied:

1. When comparing means of 4 aspects of multiple intelligences consisting of linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence, before and after applying visual art learning integration package by t – test, Paired Samples t – test type, the findings showed that multiple intelligences, before and after applying visual art learning integration package of all groups had statistically significant difference at .01 (p < .01) where the overall multiple intelligences after applying such learning was higher than before.

2. When comparing means of 4 aspects of

multiple intelligence consisting of linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence, before and after applying visual art learning integration package between group of learning achievement by applying One – Way Analysis of Variance (ANOVA), it showed that ability of students from different groups were different at a statistical significance of .01 (p < .01).

The researcher therefore performed paired comparison by applying Scheffe' s method. Referreto (Scheffe. n.d.: unpaged refer to; Luan Saiyos and Angkana Saiyos 2000: 332) the findings showed that good and excellent learning achievement group had the overall multiple intelligences higher than fair group and needed to improve group at a statistical significance of .01 and fair learning achievement group had multiple intelligences for the overall picture higher that needed to improve group at a statistical significant of .01.

Statistics Used for Data Analysis

Statistics used for defining quality of tools:

– Index of consistency (IOC) (Yuth Kaiyawan 2007: 261) visual art learning integration package plan and questionnaire for assessment of multiple intelligences before and after learning by the method of Rovinelli and Hambleton having Index of Consistency of higher than 0.50 for all items

– Defining efficiency of visual art learning integration package is done by applying formula E_1/E_2 (Chaiyong Phromwong, Somchao Nateprasert and Suda Sinsakul 1977: 49 – 51) and its efficiency was 85.92/84.97

– Defining difficulty and discrimination of multiple – choice questionnaire for assessment of 4 aspects of multiple intelligences consisting of linguistic intelligence, spatial intelligence, logic – mathematic intelligence and naturalist intelligence was done by applying Whitney and Saber (Luan Saiyos and Angkana Saiyos 1995: 197 – 198) and

then selected the questionnaire having difficulty between 0.20 – 0.80 and discrimination from 0.20 and above. It appeared that there were 62 items of the questionnaire which met the criteria and 60 items had been selected. In defining reliability of the questionnaire for assessment of 4 aspects of multiple intelligences by applying Hoyt's ANOVA procedure, it appeared that questionnaire no. 1 – 4 had reliability of 0.915, 0.958, 0.946 and 0.916, respectively.

– By analyzing attitude to visual art learning integration package, it appeared that mean of good and excellent learning achievement group was at 3.33, fair group 3.40 and needed to improve group 3.37. For the overall picture of the three groups of the student's attitude to visual art learning integration package showed good attitude to such visual art learning integration package.

Conclusion and Recommendations

This research has its aims to study and compare four aspects of multiple intelligences, namely, linguistic intelligence, spatial intelligence, logic – mathematical intelligence and naturalist intelligence of the student. The sample group covered Pratomsuksa 4 students studying in the first semester of the academic year 2008 at Pratoochai School within the Office of Phranakhon Si Ayutthaya Educational Area 1 for the amount of 185 subjects. Visual art learning integration package was use for comparison of multiple intelligences.

1. Research findings showed that visual art learning integration package was valuable learning media for learning preparation of the instructor and for learning activities of the student regarding multiple intelligences. The instructor should therefore apply such findings as a guideline for developing multiple intelligences of students in other levels for the benefit of the student.

2. The findings demonstrated that multiple intelligences of the student can be improved if

they have experienced with proper and qualified innovation. Therefore the instructor is encouraged to develop other innovations to be used for development of students' multiple intelligences.

3. Before applying visual art learning integration package, the instructor is recommended to thoroughly study and understand the content and procedures.

4. When applying visual art learning integration package, the instructor should control time, behaviour and manner of the students in order to enable learning activities to be in accordance with the objective of visual art learning integration package.

5. It is recommendable to publicize visual art learning integration package in order to increase experiences and knowledge including necessary instructing techniques for other instructors responsible for arts and visual art learning.

Suggestions for Future Study

1. Should study more about effective retention of the student after applying visual art learning integration package

2. Should develop visual art learning integration package for applying to other level of education

3. Should compare multiple intelligences of students applied with applying visual art learning integration package with other aspects of multiple intelligences

4. Should study variables or factors having relationship with or influence to multiple intelligences of the student

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