Multiple Intelligences in Virtual and Traditional Skill Instructional Learning Environments

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Abstract

The purpose of this investigation was to examine (a) how Multiple Intelligence (MI) strengths correlate to learning in virtual and traditional environments and (b) the effectiveness of learning with and without an authority figure in attendance. Participants (N=69) were randomly assigned to four groups, administered the Multiple Intelligences Developmental Assessment Scales (MIDAS™), were taught to fly cast, and were assessed on skill, form and accuracy. Results from this investigation imply that participants who score high in verbal/linguistic will be more likely to excel in virtual environments for tasks that require skill and accuracy, whereas when tasks require extensive form acquisition components the traditional classroom environment will most likely be more effective. Additionally, traditional instruction correlated with more MI profiles than any groups suggesting that for the gamut of MI in an instructional setting, traditional methods may be more effective than virtual learning environments.

An Examination of Multiple Intelligences inVirtual and Traditional Instructional Learning Environments

Introduction to Multiple Intelligences

In 1983, Gardner proposed that there were many different ways to demonstrate intellectual ability and his theory of Multiple Intelligences identified the following eight intellectual abilities: Verbal/Linguistic, Visual/Spatial, Mathematical/Logical, Musical/Rhythmic, Bodily/Kinesthetic, Naturalist, Interpersonal, and Intrapersonal (see Figure. 1) Within this theory he suggests that individuals have different intellectual strengths and weaknesses, and in order to optimize the teaching/learning environment, a teacher/coach must identify and teach to these abilities. Some portion of instruction should incorporate activities that address all intelligences, with the greater portion of MI instruction concentrating on learner's strengths. Creating MI infused instruction requires a departure from the traditional paradigms of teaching.

MI Applications in the Classroom

Implementation of MI approaches to teaching have major implications about how one approaches instructional tasks (Armstrong, 1994). Traditional instructional approaches utilize a linear process characterized by 1) lecture, 2) questions to check for understanding, 3) implementation of an application activity and 4) lesson review. This traditional instructional approach was described by Mosston (1994) as a demonstration of the entire task, its parts as well as any terminology and the learner response as following and performing the task when directed and as demonstrated. In short, this approach is teacher-centered instruction which represents more of a command style of teaching in which decisions about what was said, when it was said and what students do originates with the teacher. With MI centered instruction, there is a shift from a 'one size fits all' to a learning paradigm in which instruction is directed to the strengths of all students in a class.

Additionally, MI enhanced instruction may be

Figure 1 --- Multiple Intelligences Profiles with Subscales

Intelligence	Characteristics	Intelligence Operations
Intrapersonal	• Recognize and sort others' feelings • Create accurate mental models • Utilization of created models for decision making	Use of self reflection and analysis through journaling, logs and higher order thinking to solve problems
Interpersonal	• Recognize and classify others' feelings • Perceive the desires and intentions of others • Use of these abilities to solve problem	Use of direct interactions with others while employing cooperative learning, empathy, listening, competition and group projects to solve problems
Bodily Kinesthetic	• Use of all or parts of the body to solve problems • Use of the body to express emotions • Use of the body to practice a skill or participate in game play	Problem solving through the body or parts of the body via movement while using dance, drama, games, simulations, physical exercise and improvising or creating movement
Linguistic	• Use of written language • Use of spoken Language • Use of reading	Use of linguistic abilities through the use of essays, debates speech conversation as well as writing
Logical Mathematical	• Analysis of the abstract • Mathematical reasoning • Scientific method • Powers of deduction • Powers of Observation	Problem solving while using mathematical functions, critical thinking, logic, abstract symbols and pattern recognition
Musical	• Create, communicate and understand meanings out of sound • Ability to sense sounds vibrations, patterns, rhythm and tones	Problem solving utilizing song, instruments, rhythm, tones as well as sounds from the environment
Naturalistic	• Distinguishing among, classifying and using features of the natural world. • Interactions with the natural world • Appreciation for the natural world	Problem solving tools employed by the naturalist may include hands-on lab experiences, field trips, etc.
Spatial	• Perceive visual information • Perceiving relations (as of objects) in space • Ability to see different perspectives, e.g., visualizing an object from different angles or points of reference	Problem solving tools includes, but is not limited to, drawing, painting, and visualization, pretending and creating mental images

Armstrong, T. (1994). *Multiple intelligences in the classroom*. Alexandria, VA. Association for Supervision and Curriculum Development.

for implemented to support learning for those who possess disabilities as well as those who demonstrate exceptional learning abilities. The use of MI enhanced instruction is championed for learners with disabilities in preschool through the college classroom. MI proponents suggest that even preschool children identified with learning disabilities should be immersed in MI infused instruction to foster discovery of their own interests and talents (Rettig, 2005). Hironaka-Juteau (2006) introduced MI infused instruction by having students complete an inventory designed to identify MI strengths followed by class discussions prior to implementation. Following the implementation of instruction, students reported, "… that they develop an awareness of themselves, and a realization that they are smart in their own way" (p.160). The use of MI supports the detection of intellectual strengths which results in increased learner self-esteem, perceived self-competence and greater learning (Lumsden, 1997).

To examine the effectiveness of MI Theory infused instruction, Kornhaber, Fierros and Veenema (2004) compiled data from 41 schools (61% elementary). They found that approximately 80% of the schools reported improvements in standardized test scores. Of those schools reporting improvements, 50% attributed improvements to the implementation of instruction permeated with practices designed to support diverse student MI profiles. These gains persisted as students moved from one grade level to another, which suggests MI infused instruction serves as a catalyst for increased student engagement resulting in increased test scores. In another study, Douglas, Burton and Reese-Durham (2008) examined improvement scores from a pre and post test analysis of middle school from a test of mathematic skills. In this study, the control received traditional instruction while the experimental group used MI infused instruction. Students were taught the same objectives and content that was aligned with the North Carolina Standard Course of Study Curriculum. The pre and post test differences for the control group averaged 17.25 points in improvement while the experimental group averaged 25.48 points in improvement.

At the time of the development of this manuscript, the there was a dearth of studies documenting the effectiveness of MI instruction through experimental research methods. However, there are a few studies that examined MI profiles and academic achievement among public school learners. Al-Balhan (2006) compared the reading scores of middle school students receiving MI infused instruction to students receiving traditional instruction. Total reading score (48.96) for the MI instruction group was significantly greater than the traditional instruction total score (45.30) ($p < .05$). In addition, the mean difference scores were statistically significant (3.50 for the MI group and 2.53 for the traditional group) ($p < .05$) between groups. McMahon, Rose and Parks (2004) examined the relationship between MI profiles and fourth grade reading comprehension scores. Students with higher scores on logical-mathematical intelligence were more likely to demonstrate at or above grade-level reading comprehension scores when compared with students who scored lower on logical-mathematical intelligence. However, none of the other MI scales was predictive of student achievement.

Ozdemir, Guneysu & Tekkaya (2006) examined MI-infused instruction and traditional instructional methods in a unit of science instruction to 35 students between the ages of 9 and 10. Prior to the instructional interventions, a pretest using Diversity of Living Things Concepts Test (DLTCT) was administered to each group. Results of the pretest showed no significant difference between the treatment groups. After treatment, an independent t-test analysis indicated that MI-infused instruction produced significantly greater achievement in the understanding of the DLTCT ($p<.05$) and on students' retention of knowledge ($p<.05$). Instruction infused with MI teaching strategies may support a variety of strengths in the classroom while holding the potential for the learner to personally discover strength, promoting learning.

Despite its promise, the use of MI instructional practices seems to be ignored in higher education. Barrington (2004) advocated for the inclusion of MI in higher education classrooms but noted that "…teaching and learning in higher education institutions is often conservative and teacher-centered, and privileges certain kinds of abilities over others" (p. 432). In addition, he suggests that current instructional methods fail to take into account diverse student intelligences as well as socio-cultural values. MI is touted as a means to help students find relevancy in their studies while, at the same time, greatly enhancing learning. Kernodle and Mitchell (2003) described various MI infused instructional strategies to support psychomotor learning in tennis secondary physical education programs or in college basic instruction programs. The following shows examples of MI infused tennis instruction.

- Visual Spatial Strengths: Self Analysis: Learners are asked to view themselves on videotape and record or demonstrate positive and negative aspects of their stroke production or decision making.
- Bodily/Kinesthetic: Nothing Like Shadow Practicing: The bodily/kinesthetic learner can shadow the instructor's movements as they practice the service motion.
- Naturalist: What's the Weather: The naturalist learner may be provided opportunities to experience various environmental constraint situations (sun/wind), discuss and practice strategies that can be used for each environmental condition.
- Musical/Rhythmic: Let the Music Move You: A tennis match is very rhythmical in nature. As the players practice the different skills have them identify their own rhythms of each skill and create or locate a piece of music that highlights the skill. For example, the service motion could be associated with the 1812 OVERTURE, or a volley drill that requires the learner to alternate rather quickly from forehand to backhand works well with "RESPECT" by Aretha Franklin.
- Mathematical/Logical: Court Logic: Place the players in various locations on the court and ask them to tell you where their next shot should be hit to and to what part of the court they should recover.
- Interpersonal: Team Interview: Each participant has the opportunity to be an interviewee and an interviewer. One participant is asked questions about tennis. For example, "what is your favorite stroke?"
- Intrapersonal: My Resume: The learners will create a resume of their strengths when playing tennis. This is to be like a portfolio to provide to tennis scouts, describing how long the players have played, their tennis goals, tennis honors received, and other interest.

Authority Figure

This study also examined the necessity of having an authority figure present during the virtual learning process. Barker, Frisbie and Patrick (1989) suggested that the instructor and student interactions strengthen the effectiveness of distance learning. McCleary and Egan (1989) found that an on-site facilitator increased the effectiveness of instruction. Wiesener (1983) indicated that distance learning requires a high level of motivation, which is often a result of contact with an onsite instructor. In contrast, McKethan, Kernodle, Brantz and Fischer (2003) found the performance of undergraduate physical education majors who attempted to become more proficient in qualitative analysis of the overhand throw using distance learning without an authority figure present were not positively affected. However, none of these studies were attempted in a virtual learning environment.

It is not clear if different MI strengths are affected by the learning environment and the integration of MI theory into instructional practices has not been widely supported by empirical research. This includes investigations of observational learning, skill, form and accuracy acquisition in virtual and traditional environments. Therefore, the purpose of this investigation was to examine (a) how Multiple Intelligence (MI) strengths correlate to learning a multiple degree of freedom task (i.e. fly fishing) in virtual and traditional environments and (b) the effectiveness of learning with and without an authority figure in attendance.

Method

Apparatus and Software

The apparatus and software for the virtual modeling and instruction via virtual monitoring consisted of PC laptop computers, ear phones, and virtual modeling instructional software. Since the virtual treatment was an interactive process of receiving instruction and practicing the fly cast, the computers were placed in the rear of the fly casting stations so that subjects were physically and visually isolated from others receiving information or practicing the fly casting skill. The virtual environment was designed to replicate the learning environment utilized for the treatment group receiving traditional instruction.

Unprocessed video of the model was recorded on a MiniDV tape in a digital format using a Canon ZR 30 video camcorder. The camera was positioned at a 45 degree angle to the model at a distance of 30 feet to allow for a wide view of the casting motion. An Azden WLX-PRO, On-Camera VHF wireless system was used to capture verbal instructions. The model wore a transmitter with a lapel microphone, and the wireless receiver was attached to the hot shoe of the ZR 30 camcorder.

The virtual modeling environment for this project was created using Sum-Total ToolBook Assistant and was displayed on two screens. The first screen included a sequence of directions for the participant to follow. These directions were arranged on the left side of the screen with the main area of the screen left blank. Participants first clicked on a button to view a pop-up of the model performing the entire skill sequence that filled the entire screen. The second screen of the instructional software consisted of four direction sequences. Similar to the first screen, the directions were arranged on the left side of the screen. In the main portion of the screen, the names of the nine skill cues (see Figure 2) that comprised the fly casting skill were listed. A text description was located to the right of each skill cue. Each skill cue name functioned as a trigger which, when clicked, allowed for a viewing of the model performing the cue and audio of the cue. An exit button and a button back to page one were located in the lower right side of screen 2. The virtual instruction apparatus consisted of IBM ThinkPad Pentium II-based laptop computers, ear phones, and the virtual modeling instructional software. The computer was configured with 256 megabytes of RAM memory and an integrated video board. Following interactive instruction and fly-cast practice, all casts for accuracy were recorded using the Canon ZR 30 MiniDV.

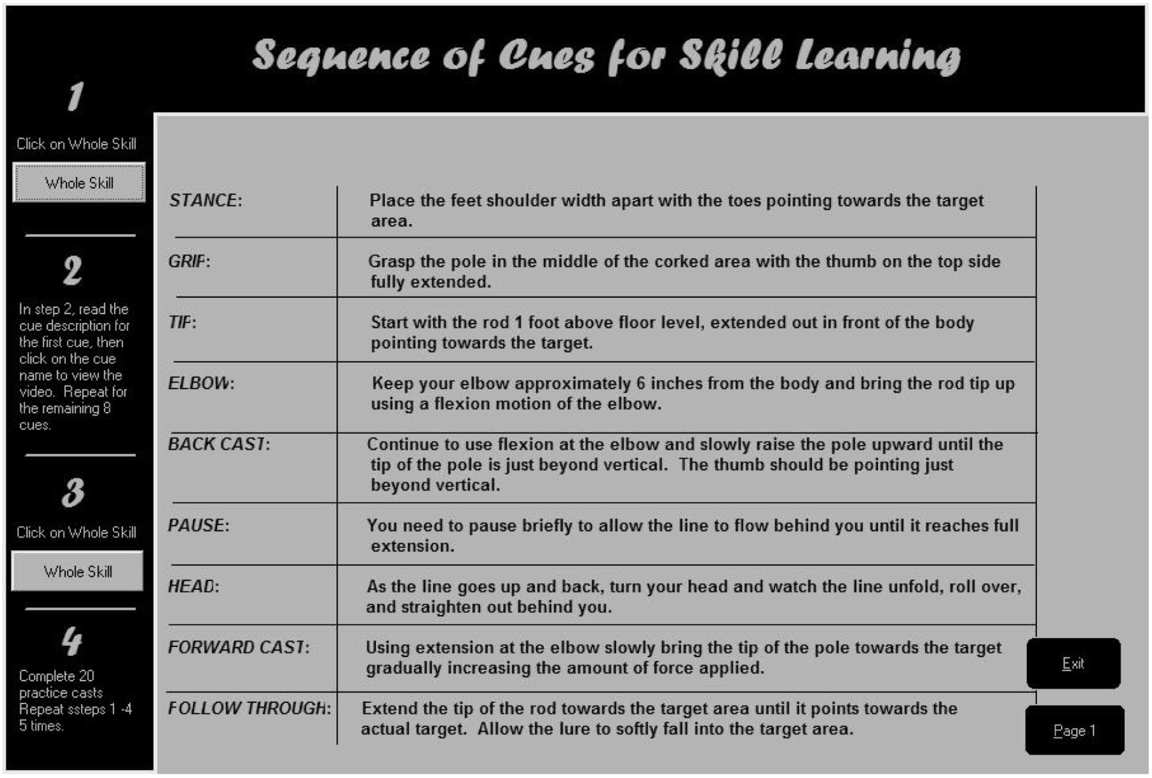
Pilot Study

Prior to the beginning of the actual research project, a pilot study was conducted to refine the procedural aspects of the project such as effective placement of the cameras, software functionality, on-site training for the model to become proficient with the introduction and modeling segments, and the research team's efficiency with equipment set up and breakdown. Also, all members of the research team completed a fly casting course taught by an accredited expert. This course included information about the materials (rod, reel, line etc.), instruction about the mechanics and cues (stance, grip, cast, etc.) of fly casting, and 400 practice trials with constructive feedback.

Procedure

Several weeks before the beginning of the project all participants completed the Multiple Intelligences Developmental Assessment Scales (MIDAS™) which is used to generate MI profiles. The eight intelligences were quantified along with

Figure 2 --- Cue Sequence



subscales that provided documentation of intelligence (MI Research and Consulting, Inc). See Figure 1 for a comprehensive description of the intelligences and subscales. On Day 1, the research team met with each group of participants separately to familiarize them with the environment and provide instructions explaining the experiment. Participants were then pretested by attempting 10 trials with the goal of casting a macramé lure into the center of a hula hoop located 35 feet directly in front of the casting position in a large indoor arena. This distance was selected after conversations with fly-casting experts who stated that 35 feet was considered an appropriate distance for the requirements of this study. Following the pretest the VM-A, VM-NA, and Traditional groups were provided an orientation to fly fishing by a casting expert (not including the cues and actual mechanics of the cast). The virtual learning groups received this information via a virtual learning environment and the Traditional group received the information from the expert in a real time environment. The fly casting expert was provided a script and trained until the live orientation, without notes, was the same as the virtual orientation.

On Days 2-6, participants in all three groups received the same amount of information. Each participant in the Virtual Modeling groups was directed to his/her own isolated virtual learning station to observe the model on a 17 inch computer screen. The authority figure moved among the stations to establish a physical presence among the participants in the VM-A group. The appropriate procedure was taped to the table next to each computer. This was the only information provided to these two groups. Each participant viewed the Virtual Model of the expert demonstrating and explaining the fly cast using the whole-part-whole method. Participants initially viewed the skill performed as a whole, then navigated to a screen that showed the model demonstrating and explaining the nine sequential casting cues, and returned to view the skill performed as a whole. As illustrated in Figure 2, participants clicked on the cue for each part and were able to view the model performing each part. Following the treatment, participants completed 20 practice casts and returned to the computer station. This sequence continued until 80 casts were completed (four sets of practice trials).

Participants were then tested on the last 10 trials (trials 81-90). The Traditional group viewed a live model demonstrating the skill as a whole, followed by the model demonstrating and explaining the nine sequential casting cues, and ending by performing the skill as a whole. As with the Virtual Modeling groups, this sequence continued until 80 practice trials were completed and the participants were tested on trials 81-90. The control received no treatment and was tested on 10 trials each day. A retention test with no intervention occurred 5 days after Day 6 whereby all participants were allowed 5 warm-up trials and then tested on the next 10 trials.

Testing methods.

Each test trial was evaluated in the following three ways:

1. Accuracy Score: Each test cast for every participant resulted in a score of one (inside) or zero (outside) the target, with a possible scoring range (added scores from the ten test casts) from 0 to10.
2. Aesthetic Quality Score: An expert fly fisherman with 10 years of on-site fly fishing and teaching observed video replay of every participant and used a Likert scale of 1-7 to score each trial on the aesthetics (form) of the cast. The aesthetic components score included stance, grip position, tip, elbow, back cast, pause, head, forward cast and follow through.
3. Skill Acquisition Score: Two observers (inter rater reliability of .88) with a strong background in teaching, video and qualitative analysis, as well as fly fishing, observed video replay of each participant and scored each cast based upon adherence to the nine sequential cues provided during the treatment sessions. A score ranging from 0 to 9 could be achieved. Prior to the scoring of the test trials, the observers established an inter observer reliability of .88. In order to achieve an acceptable inter observer reliability coefficient, the observers scored 10 randomly selected test trials from videos acquired during the pilot study. A reliability coefficient was then tabulated and differences in the scoring measures were discussed. This procedure continued until the coefficient reached or exceeded .80. The retention test occurred 5 days after Day 6. Each participant was allowed 5 warm up trials and then tested on the next 10 trials.

Subjects

Sixty-eight undergraduate university students ranging in age from 18 to 21 years volunteered to participate. Participants were randomly assigned to one of the following four groups: Traditional Instruction (TRAD) (n=17), Virtual Learning without an authority figure (VM-NA) (n=16), Virtual Learning with an authority figure (VM-A) (n=16), and control (CONT) (n=19). Differences in treatment group sizes were due to participant attrition. With IRB approval, all participants taking part in this investigation signed consent forms and were treated in accordance with the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 1992).

Results

As noted in the Multiple Intelligence Professional Manual, the scale scores are classified thus: Very High: 80 – 100, High: 60 – 79, Moderate: 40 – 59, Low: 20 – 39, Very Low: 0- 19. To examine whether the collective participants had any distinctive strengths or weaknesses on the MIDAS prior to treatment an examination was conducted and found that the collective subjects had higher than norm scale scores on interpersonal and bodily-kinesthetic and lower scores on mathematical-logical profiles (Table 1). However, ANOVA verified no statistical difference between randomly assigned groups prior to treatment.

SPSS 14 software was used to compile statistical information between test groups for learning outcomes using Pearson's Correlation. In each group subjects were sorted by completing each of the learning outcomes in Accuracy, Aesthetic Quality, and Skill Acquisition with established cut scores for success (achievers) and non-successful completion of task (non-achievers). Control group achievers did not correlate with MI strengths on any task with the exception of skill retention which was negatively correlated with subjects who had strengths in naturalist (-0.47) and visual spatial (-.60) profiles (see Table 2). Those achievers in the TRAD group correlated on the aesthetic retention test with subjects who had strengths in verbal-linguistic intelligence (.61) and intrapersonal intelligence (.52). The TRAD group achievers also correlated on the aesthetic transfer test in the areas of musical intelligence (.49), logical-mathematical intelligence (.62), verbal-linguistic intelligence (.60), interpersonal intelligence (.52), and intrapersonal intelligence (.70) (see Table 3). The VM-NA achievers correlated on the skill acquisition retention test with subjects that had musical-rhythmical strengths (.48) and with those with verbal linguistic strengths on the aesthetic transfer test (52). The VM-NA achievers group also showed significant correlations on accuracy retention and transfer tests for subjects with strengths in linguistic intelligence (.52), and bodily-kinesthetic intelligence (.65), but negatively correlated on the aesthetic quality retention assessment in musical intelligence (-.49) (see Table 4). The VM-A achievers negatively correlated on the skill acquisition test amongst bodily-kinesthetic (-.59), logical-mathematical (-.49) and interpersonal (-.55) profiles. Additionally, this group's skill acquisition (.55) and accuracy retention transfer (.59) scores correlated with musical intelligence strengths (see Table 5).

Discussion

The results of this investigation suggested that a virtual learning environment was better suited for students who strengths are verbal/linguistic, bodily/kinesthetic intelligence and musical/rhythmical. More specifically students who have strengths in verbal-linguistics may excel in virtual environments for tasks that require accuracy, but when the tasks require extensive form acquisition components the traditional learning environment should be more effective. Furthermore, when an authority figure is present during a virtual learning environment performance of students with bodily/kinesthetic, logical/mathematical, and interpersonal strengths; skill acquisition decreased implying that these individuals may excel in unsupervised distance and/or virtual learning environments. It is also important to note that when students with strengths in naturalist and visual/spatial intelligences are given no instructional support, their actual skill retention negatively correlated over test trials; thereby, implying that these students will show decrements in learning unless given some facilitation support. Students with musical-rhythmical intelligence strengths perform better on accuracy retention and skill acquisition in a virtual environment, but when form is a significant component of the task, learning will be enhanced in a traditional environment. Students with intrapersonal strengths learn more effectively in a traditional environment, especially when the acquisition of appropriate form is essential. Additionally, traditional learning correlated with more multiple intelligences than either of the virtual learning environment groups.

The traditional learning environment frequently focuses on the verbal/linguistic and visual/spatial multiple intelligences. However, the results of this study suggest that students with musical-rhythmical, mathematical-logical, verbal-linguistic and bodily-kinesthetic strengths might thrive in a virtual learning environment. This study highlights the need for more investigations into the possibility that instructional strategies that focus on the appropriate MI strengths among students can enhance teaching/learning.

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Table 1: Descriptive Statistics of Collective Groups Multiple Intelligence Scores

MI Intelligence		N	Minimum	Maximum	Mean
Interpersonal	69	31.90	97.40	65.41	13.07
Bodily-Kinesthetic	69	35.40	93.80	60.21	10.40
Intrapersonal	69	24.00	85.00	54.52	11.26
Verbal-Linguistic	69	18.40	90.80	48.39	15.79
Naturalist	69	1.60	85.00	47.03	18.24
Visual-Spatial	69	6.30	81.30	46.71	16.22
Musical-Rhythmical	69	9.10	87.50	43.87	17.07
Logical-Mathematical	69	13.80	77.50	43.84	14.73

Table 2
Pearson correlation of control group by Accuracy, Aesthetic Quality and Skill Acquisition Development

	Accuracy retention	Accuracy transfer	Aesthetic Quality retention	Aesthetic Quality transfer	Skill Acquisition retention	Skill Acquisition transfer
Musical-rhythmical	.38	.00	-.13	-.17	.06	.18
Bodily-kinesthetic	.06	.00	-.33	-.08	-.32	-.15
Logical-mathematical	.13	.00	.05	-.41	-.36	-.04
Visual-spatial	-.02	.00	.19	-.29	-.47*	-.24
Verbal-linguistic	.12	.00	-.03	.10	-.41	.09
Interpersonal	-.34	.00	-.14	-.09	-.14	-.02
Intrapersonal	-1.0	.00	.01	-.15	-.34	.09
Naturalist	.16	.00	-.21	.12	-.60**	-.25

Note: Sig. (2 tailed) *p<.05. ** p<.01.

Table 3
Pearson correlation of traditional group by Accuracy, Aesthetic Quality and Skill Acquisition Development

	Accuracy retention	Accuracy transfer	Aesthetic Quality retention	Aesthetic Quality transfer	Skill Acquisition retention	Skill Acquisition transfer
Musical-rhythmical	.16	.12	.31	.49 *	-.16	-.01
Bodily-kinesthetic	-.03	.01	.44	.26	-.26	-.26
Logical-mathematical	.37	.06	.41	.62**	.03	.09
Visual-spatial	.34	.08	.13	.21	-.12	-.12
Verbal-linguistic	.09	.13	.61**	.60**	-.14	-.06
Interpersonal	.24	.15	.37	.52*	.06	.24
Intrapersonal	.38	.22	.52*	.70**	.09	.25
Naturalist	.03	-.19	.07	.17	-.39	-.29

Note: Sig. (2 tailed) *p<.05. ** p<.01.

Table 4: Pearson correlation of VME-NA group by Accuracy, Aesthetic Quality and Skill Acquisition Development

	Accuracy retention	Accuracy transfer	Aesthetic Quality retention	Aesthetic Quality transfer	Skill Acquisition retention	Skill Acquisition transfer
Musical-rhythmical	-.35	-.04	.13	-.05	.48*	.40
Bodily-kinesthetic	.11	.65**	-.27	.18	-.06	.13
Logical-mathematical	-.06	-.05	-.49*	-.24	-.18	-.15
Visual-spatial	.28	.18	-.28	.08	-.11	.04
Verbal-linguistic	.22	.50*	.41	.52*	.26	.27
Interpersonal	-.38	-.42	-.14	-.31	.18	.27
Intrapersonal	-.13	-.25	-.28	-.22	.21	.20
Naturalist	-.28	-.17	-.12	-.07	-.13	-.26

Note: Sig. (2 tailed) *p<.05. ** p<.01.

Table 5: Pearson correlation of VME-A group by Accuracy, Aesthetic Quality and Skill Acquisition Development

	Accuracy retention	Accuracy transfer	Aesthetic Quality retention	Aesthetic Quality transfer	Skill Acquisition retention	Skill Acquisition transfer
Musical-rhythmical	.60*	.43	.32	.27	.33	.56*
Bodily-kinesthetic	.03	-.08	.03	-.08	-.59*	-.23
Logical-mathematical	-.39	.02	-.25	.04	-.49*	-.40
Visual-spatial	.15	.26	.20	.45	-.07	.17
Verbal-linguistic	-.30	-.29	.09	.22	-.41	.12
Interpersonal	-.11	.11	.21	.22	-.55*	-.19
Intrapersonal	-.16	.18	.05	.18	-.20	.07
Naturalist	.04	.40	.06	.15	-.18	-.30

Note: Sig. (2 tailed) *p<.05.