

## Matching Learning Styles with Teaching Methods: Integrating Social Studies, Mathematics, and Art Using Simulation Games

Dr. Willie McNeill, Jr.<sup>1\*</sup> & Robert Arndt<sup>2</sup>

<sup>1\*</sup>Professor  
Department of Professional Pedagogy and Research  
University of North Carolina at Pembroke  
PO Box 1510

<sup>2</sup>Reference/Instructional Services Librarian  
University of North Carolina at Pembroke  
PO Box 1510

Accepted 23 June, 2014

### ABSTRACT

Teaching a population of diverse learners in the 21<sup>st</sup> Century, learning styles may be as unique as handwriting. It is the teacher's responsibility to learn these styles and match individual instruction to meet the needs of each individual student. A survey was conducted in a local high school social studies class to determine the preference of a learning style.

**Keywords:** Learning styles, teaching styles, active learning, simulation games.

### Introduction

One might think that schools and classroom should be quiet places which promote thinking and learning. Sadker and Zittleman (2009) noted that different subjects, such as math and English should be offered in the morning when students are fresh and alert: eating and drinking in the classroom should not be allowed; classroom periods should be limited to between forty-five and fifty-five minutes to insure adequate time to investigate significant issues and practice important skills. They also believed that students learn best when an emphasis is placed on the reading textbooks and listening to lectures, but recognized that not all students learn in this manner because of different learning styles (Sadker and Zittleman, 2009).

Sadker and Zittleman were building on Rita and Kenneth Dunn (1979) observation that regardless of age, ability, socio-economic status, or achievement level, students respond differently to their environment. Some students need complete silence when concentrating, while others do not. Some may listen to music while concentrating. Some students respond differently to temperature. Just as there are many learning styles, there are also many teaching styles. Some teachers rely heavily on lecture while others promote student investigation of subject matter. Some teachers use cooperative learning strategies while others use individualized and differentiated instructions. Regardless of teaching styles, some use the chalkboard and explain materials while others present material using overhead projectors or PowerPoint software. Some teachers prefer to group students based upon similar ability levels while others prefer heterogeneous grouping. No matter what teaching style is employed, the ultimate objective is to achieve maximum student learning.

### Objectives

The purpose of the study was to determine which method of teaching achieves the highest level of student learning. The instruction methods used were: lecture, mnemonic strategies, cooperative learning, mastery learning, homogeneous grouping, heterogeneous grouping, hands-on instruction, individualized instruction, differentiated instruction, teaching math in the morning and arrangement student seats in circles.

### Review

A number of authors have stressed the importance of simulation in the middle grades. Callahan, Clark, and Kellough (1998) have described simulation as "an enactment of a make believe episode as much like the real thing as possible. Simulation aimed at developing skills, can be useful for helping students gain insights into difficult matters. For example, in the social studies classroom, the students simulating the management of a business are learning what happens when they overbuy, overprice, and make strategic errors" (p.268). Orlich (1998) agrees, stating "Simulation can be used to stimulate interest in a topic, provide information, enhance skill development, change attitudes, and assess performance by measuring it against an already established standard" (p.271). Johnson (1996) stressed the recreation of reality in simulation settings which "present the learner with lifelike situations"(p.478). It can be very useful in accessing the higher levels of the cognitive domain of learning. The lifelike learning situations are very important in today's current Common Core culture that seeks to make education relate to the "real world". Another aspect of simulation noted by Posner and Rudnitsky (1997) is that it "can be used to help students explore thoughts, feelings and fantasies about themselves, others, or even places and things. The teacher

often sets up the situation that students will explore as a group (p. 167).

The social studies classroom is an apt environment to use simulation to encourage students to become more knowledgeable by solving political, economic, social, and moral problems that plague society.

## Method

### Participants

Fifty ninth grade students at a high-minority, rural high school in a low socioeconomic area of North Carolina were presented a lesson entitled Inter-grading Social Studies, Mathematics and Art through Simulation/Gaming. The students participated in a hands-on-experiences on simulation/gaming. The fourteen teaching strategies stated above were used in the present study to determine the most effective strategy for teaching.

### Procedure

Based upon Boston's "Unequal Resources: A group simulation" (1998), students are asked to compare imports and exports from three countries: Tanzania, an undeveloped country, Saudi Arabia, a developing country, and the United States, a developed country. The teacher displays a three column graphic organizer for comparison in any format. The teacher writes the definitions of exports and imports. Exports are products that are shipped out of the country. Imports are products shipped into the country.

The teacher tells the students that every country has some scarcity - that resources are limited but the needs and wants of

that country are unlimited. The teacher also explains that societies need one another to cooperate in solving environmental, energy, economic, political and other problems and to maintain peace. The contents of the each team's envelope will be representative the resources available to the country.

The teacher tells the students that they are going to participate in an activity in which they will be asked to perform tasks to meet the needs and wants of a country. The class is divided into four groups. Each group represents a country and is assigned to a table.

**Objective 1:** Through simulation/gaming, the students will recognize the differences of unequal resources among countries.

**Objective 2:** Through simulation/gaming, the students will integrate math and arts by making their projects.

The teacher then distributes to each group an envelope with a task sheet attached to each group. The students are instructed not to open the envelopes until permission is given. The students are then asked to read the task sheet. See Appendix 1 for the task sheet and envelope contents.

### Findings

Fourteen teaching strategies (listed below in the table) were used to determine which strategies were the most effective. Students were surveyed using a 5 point Likert scale to determine their preference of teaching methods by asking "Students learn better when teachers...." See Appendix 2 for the complete survey.

Teaching Method	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Lecture	9 (18%)	20 (40%)	9 (18%)	8 (16%)	4 (8%)
Uses Chalkboard	6 (12%)	18 (36%)	14 (28%)	12 (24%)	0 (0%)
Uses Overhead	4 (8%)	30 (60%)	8 (16%)	7 (14%)	1 (2%)
PowerPoint	12 (24 %)	27 (54%)	5 (10%)	5 (10%)	1 (2%)
Mnemonic devices	21 (42%)	16 (32%)	9 (18%)	3 (6%)	1 (2%)
Cooperative Learning	15 (30%)	30 (60%)	2 (4%)	2 (4%)	1 (2%)
Mastery Learning	11 (22%)	17 (34%)	12 (24%)	8 (16%)	2 (4%)
Homogeneous Learning	5 (10%)	19 (38%)	10 (20%)	11 (22%)	5 (10%)
Heterogeneous Learning	14 (28%)	18 (36%)	13 (26%)	4 (8%)	1 (2%)
Hands-on experience	32 (64%)	14 (28%)	1 (2%)	3 (6%)	0(0%)
Individualized Instruction	7 (14%)	14 (28%)	11 (22%)	18 (36%)	0 (0%)
Differentiated Instruction	7 (14%)	11 (22%)	23 (46%)	5 (10%)	4 (8%)
Scheduling for optimum learning	7 (14%)	7 (14%)	10 (20%)	12 (24%)	14 (28%)
Varied room arrangement patterns	9 (18%)	21 (42%)	13 (26%)	4 (8%)	3 (6%)

The most popular teaching methods (determined by combining the Strongly Agree and Agree responses) were hands-on experience (92%), use of PowerPoint to explain material (78%),

and mnemonic strategies to retain information (72%). This is not surprising due emphasis on active learning. The numbers (58%) agreeing with lecture being an effect

method of instruction is surprising because it is not a method of active learning. Students disagreed most with the statement that learning best by scheduling for optimal times for learning.

## Conclusions

Classroom teachers should employ hands-on teaching to the fullest extent possible giving attention to problem-solving, cooperative learning experiences. This recommendation is based on outcomes observed in the simulation/game activity in which students participated and achieved. Cooperative learning ranked second because this strategy required students had to work cooperatively and collaboratively in order to complete the "Unequal Resource Task Sheet." The use of PowerPoint technology as well as strategies using the over-head projector ranked third and fourth respectively. These formats can be enhanced with clip art, music, and colors to emphasize key terms and major concepts in the printed lessons and activities.

The variable that rated least positive pertains to the "time of day" for instruction. This finding contradicts Dunn and Dunn's (1983, 1985) work as well as the work of Morton and Kershner (1985) which suggest that gifted students perform better in the afternoon as opposed to the morning. Because the survey question asked about when math could be better learned, the students could have math phobic and the timing of the class is irrelevant. Although the findings are mixed, Dunn's (1983, 1985) work in high schools also supports that optimum learning takes place in the afternoon as well as late morning.

Several concepts on the "Student Evaluation of Instruction" may have been unfamiliar to the students leading the students to select middle of the road responses (Agree, Neutral, and Disagree). Use of less specialized terms on a future survey may

provide a truer reflection of student preferred method of instruction.

The current emphasis on Common Core makes hands-on active learning imperative as the students learn concepts with real world applications by actively engaging the concept. Engaged students are learning students.

## References

1. Boston, J. A. (1998). Unequal resources: A group simulation. *Social Studies Review*, 37(2), 33-37.
2. Callahan, J. F., Clark, L. H., & Kellough, R. D. (1998). *Teaching in the middle and secondary schools*. Upper Saddle River, N.J: Merrill
3. Dunn, R. S., & Dunn, K. J. (1979). Learning styles/teaching styles: Should they...can they...be matched?. *Educational Leadership*, 36(4), 238-244.
4. Johnson, J.A. (1996). *Introduction to the foundations of American education*. Boston: Allyn and Bacon.
5. Klein, J. (2001). Attention, scholastic achievement and timing of lessons. *Scandinavian Journal of Education Research*, 45(3), 301-309.
6. Orlich, D. C. (1998). *Teaching strategies: A guide to better instruction*. Boston: Houghton Mifflin Co.
7. Papalia, D. E., Olds, S. W., & Feldman, R. D. (2007). *Human development*. Boston: McGraw-Hill
8. Posner, G. J., & Rudnitsky, A. N. (1997). *Course design: A guide to curriculum development for teachers*. New York: Longman.
9. Sadker, D. M., & Zittleman, K. R. (2009). *Teachers, schools, and society: A brief introduction to education*. McGraw-Hill Higher Education: Boston

## Appendices

### Appendix 1

#### UNEQUAL RESOURCES TASK SHEET

Your group has the problem of providing for certain needs and wants for your country. These needs and wants are met by completing the tasks listed below.

1. Food – Make four strips of gold paper each three inches by one inch.
2. Clothing – Make a green "T" four inches high
3. Shelter – Make a white square two inches and attach a gold triangle to one side of the square.
4. Industry – Make a four-link paper chain, each of a different color.
5. Education – Make a four page book out of two different colors.

#### Contents of the Envelope

Envelope # 1: Two scissors, one ruler, twenty paper clips, two pencils, and two 4"squares of red paper and two 4"squares of white paper.

Envelope # 2: One scissor, glue and sheets of paper - two of each color; blue, white and gold.

Envelope # 3: Two felt pens and sheets of paper - two of each color; green white and gold.

Envelope # 4: Sheet of paper, one of each color; gold, blue, red, and purple.

**Materials**

1. Task sheet - one for each of the 4 groups
2. Four large envelopes
3. Three pairs of scissors
4. Twenty paper clips
5. One ruler
6. One bottle of glue
7. Two felt pens
8. Two pencils
9. Colored paper – 8 x 11 sheets (two red, five white, three blue, five gold, three green, one purple)

**Appendix 2****Student Evaluation of Instruction**

Indicate the extent in which you agree that the following statements about the lesson by checking the appropriate box to the right of the statement.

	<b>SA</b>	<b>A</b>	<b>N</b>	<b>D</b>	<b>SD</b>
1. Students learn better when teachers lecture.					
2. Students learn better when teachers explain information using the chalk board.					
3. Students learn better when teachers explain information using the overhead projector.					
4. Students learn better when teachers explain information using the PowerPoint.					
5. Students learn better when teachers teach mnemonic strategies.					
6. Students learn better when teachers use cooperative learning.					
7. Students learn better when teachers use mastery learning.					
8. Students learn better when teachers use homogeneous grouping.					
9. Students learn better when teachers use heterogeneous grouping.					
10. Students learn better when teachers use hands-on experiences.					
11. Students learn better when teachers use individualized instruction.					
12. Students learn better when teachers use differentiated instruction.					
13. Students learn better when math is taught in the morning.					
14. Students learn better when teachers arrange seats in a circle.					