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ABSTRACT
                To meet the challenges created by diverse learning
styles and abilities, community college students are often required
to take placement tests to identify individual learning styles. This
study was conducted to determine whether organizing students into
activity groups based on learning style contributes to performance;
and whether grouping students into activity groups representing at
least two different learning styles contributes to a reduction in
each student's test anxiety score. The Transactional Ability
Inventory (TAI), a quickly scored test that categorizes students into
one of four learning styles, and the Test Anxiety Scale (TAS) were
administered to 46 students at the beginning of the 1992 spring
quarter. On the basis of the TAI students were placed into activity
groups so that at least two learning styles were represented in each
group. At the end of the quarter the TAI, the TAS, and a
questionnaire were completed by students. Even though differences in
the pre- and post-test scores were not significant, most students
agreed with the results of the TAI and had favorable comments
regarding working in groups. Statistical analysis of the TAS
indicated that grouping students with someone who perceived and
processed materials in a different way was very beneficial in
reducing test anxiety. A copy of the learning styles questionnaire is
appended. (LL)

STRENGTH THROUGH DIVERSITY:

UTILIZING DIVERSE LEARNING STYLES STUDY GROUPS

TO

STRENGTHEN TEACHING AND LEARNING SKILLS.

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STRENGTH THROUGH DIVERSITY:
UTILIZING DIVERSE LEARNING STYLES
STUDY GROUPS TO STRENGTHEN TEACHING AND LEARNING SKILLS.

Students of all ages and backgrounds arrive on the community college campus with a variety of expectations ranging from that of obtaining a greater general understanding and appreciation of life to that of obtaining specific technical skills equiping them to enter the work force. Accompanying these diverse student expectations is a student body with a diversity of learning styles and abilities. To meet the challenges created by these diversities the admissions office along with the counseling center often requires the students to take placement tests so that the students can be guided into his/her classes and be successful.

Within the classroom setting the instructors may choose to adminster learning styles instruments to identify the student's learning styles and with that knowledge organize their presentations so that the students will have successful learning experiences. There are several learning styles available such as The Learning and Study Strategies Inventory (LASSI) (Weinsten, et.al., 1987) which can be used to assess ten different areas related to the student's learning and study styles. A second instrument is GALT (Group Assessment of Logical Thinking) developed by Roadrangka, et.al. (1983) following Piaget's theory of cognitive thinking. The Galt identifies the student's learning as either concrete, transitional, or formal. A third learning styles identification technique is explained by McCarthy (1984) as the 4

1

Mat System in which learners are grouped into four types. These four types are described by Osterman, et. al. (1985) as the following: 1) Type 1 learners who are innovative, feelers who prefer to learn by dissusion; 2) Type 2 learners who learn best through the lecture technique since they are analytical and like to think about the presentation; 3) Type 3 learners who use the common sense approach to learning and prefer demonstrations and problem-solving activities; and 4) Type 4 learners who rely on intuition and self-discovery. Mitchell (1983) reports of many learning styles tests for all grade level including the Learning Styles Inventory by Renzulli and Smith (1978) for grades four through twelve and a Learning Stykes Inventory by Canfield (1976-80) for sixth grade through postgrade level.

The Transactional Ability Inventory by Gregorc, (1978) is very helpful, quickly scored learning styles inventory in which the student, using a list of defined words, rates himself/herself into one of four styles: concrete structured (sequential), absract structured (sequential), concrete random, and abstract random. Each of these four styles can be utilized by an individual but usually he/she uses only one or two and the teaching techniques which best suit each style differ (Gregorc and Butler, 1984).

According to Gregorc and Butler (1984) the concrete sequential mode of thinking allows one to "label, remember and control discrete parts of the physical environment,... to work step-by-step, ...[mode] that most vocational or technical fields require (p. 28). This learning style utilizes hands-on activities and

projects for maximum benefits. The abilities of concrete structured learning will vary from memorization and drill work to creating very precise original products while utilizing an orgnized step-by-step procedure.

The abstract structured or sequential learner uses logic while viewing the overall picture. This learner often enjoys making long-range plans in which details can be worked out later. This type learner likes to deal with thearies and concepts which continually leads him/her to further study (Gregorc and Butler, 1984).

The concrete random learning style prevents the person from being a complacent all-accepting student since the concrete random person is very inquisitive and always questioning why things are done a certain way. This style learner likes to find out what makes things work and why. These questions can lead the concrete learner to experimentation and new inventions. He/she may approach a problem in a non-conventional manner enabling him/her to be a good diagnostician (Gregorc and Butler, 1984).

Emotionality is a characteristic of the abstract random learning style individual who relates to the entire environment including the room temperature, lighting, mood of others, etc. (Gregorc and Butler, 1984). According to Gregorc (1978) this style learner "associates the medium with the message." Since working well with others seems to be a characteristic of the abstract random learning style individual then working in

cooperative study groups and being involved in team activities are preferred to working independently.

The teaching techniques and assignments which work best for the four learning styles of concrete structured, concrete random, abstract structured, and abstract rand are as follows:

CONCRETE STRUCTURED (CS):

1. Workbooks or lab manuals;

2. Lectures accompanied with overhead transparencies, drawings, or models; demonstration teaching;

3. Hands on materials;

4. Field trips;

5. Programmed instruction.

TEACHER EXPECTATIONS OF CS STUDENTS:

1. Follow step-by-step instructions;

2. Use drill techniques to practice what they have learned;

3. Give correct answers available from the text.

CONCRETE RANDOM (CR):

1. Games or simulations;

2. Independent study projects;

3. Optional reading assignments;

4. Brief mini-lectures;

5. Problem solving activities.

TEACHER EXPECTATIONS OF CR STUDENTS:

1. Frame hypothese, develop alternative
   solutions and test them.

2. Be able to solve problems with limited
   information or data provided;

3. Experiment with the ideas and materials
   through application.

ABSTRACT STRUCTURED (AS):

1. Instuctional phonograph records;

2. Audio tapes [video tapes];

3. Extensive textbook reading assignments;

4. Slides;

5. Lecture.

TEACHER EXPECTATIONS OF AS STUDENTS:

1. Be wlling and able to read larhe
   amounts of material;

2. Be able to conceptualize ideas and
   convey them either orally or in
   writing;

3. Be able to concentrate on an idea
   without being distracted by
   environmental activities or inner

feelings.

ABSTRACT RANDOM (AR):

1. Movies, [videos], and filmstrips with records;

2. Group discussions among students;

3. Lecture with discussion of material presented;

4. Television;

5. Short reading assignments which are springboards for class activities.

TEACHER EXPECTATIONS OF AR STUDENTS:

1. Listen to, learn from, and respond to their fellow students;

2. Be aware of color, sounds and moods in their environment;

3. Observe body language, listen for intonation and reflect upon these in connection with the message being given. (Gregorc, 1978).

Research Questions

The investigation was designed to answer the following research questions:

Did grouping students into activity groups according to
their learning styles contribute to each student's
performance on the Transactional Analysis Inventory
(TAI) when the posttest TAI score was compared to the
pretest TAI score?

Did grouping students into activity groups with student
representing at least two different learning styles as
identified by the TAI contribute to a reduction in each
student's test anxiety score upon comparing the pretest
Test Anxiety Scale (TAS) score to the posttest TAS
score?

The research questions led to two null hypotheses:

There will be no significant difference between the
means on the student's pretest and posttest scores of
the TAI as a result of grouping students in activity
groups in which at least two different learning styles
are represented.

There will be no significant difference between the
means on the student's pretest and posttest scores of
the Test Anxiety Scale (TAS) as a result of grouping
students in activity groups in which at least two
different learning styles are represented.

Use of the Transactional Analysis Inventory to Group Community
College Students

The Transactional Analysis Inventory (TAI) by Gregorc (1978)

was administered to two groups of anatomy and physiology students at the beginning of Spring Quarter (March) 1992 attending a southeast Alabama community colllege. In group 1, N=18 and in group 2, N=26 making a total of 46 students. The students were also given the 16 item Test Anxiety Scale (TAS) by Sarason (1978) to measure their level of test anxiety. On the basis of the TAI the students were placed into activity groups so that at least two of the learning styles were represented in each group. If at all possible all four groups were represented in each group so that learning activities would have the greatest effect in a similar arrangement as the study by Price (1991). Wheeler and Flurkay (1990) stated that partners with different styles could compliment their strengths and would exhibit more creativity than if thay had the same style. The author explained that the learning styles of concrete structured, concrete random, abstract structured and apstract random were ways that a person perceives and processes information and that there was no best or worse way to process the information.

Students were informed that by gaining knowledge of their particular learning style they would be able to prepare assignments and perhaps organize their study sessions more efficiently. Even though no particular stress management workshops or test-taking skills workshops (Geier, 1986) were involved, perhaps by having knowledge of their learning style and working in small heterogeneous study groups the students' test anxiety levels might be decreased. By knowing the learning styles of the students the

instructor informed the students that she would be able to present the material in a manner suiting their needs.

During the laboratory periods throughout the quarter the students worked in their study (activity) groups for a variety of learning experiences. Some of the activities included completetion of take-home review tests, studying models and slides of tissues and organs, and taking "group" tests which were review laboratory examinations designed to prepare the students for actual examinations.

Several authors have presented research elaborated upon the methods and the importance of group work to increase students' learning. In an effort toimprove students' understanding on scientific concepts and to clarify misconceptions of community college science students, Basili and Sanford (1991) utilized groups. Hawkes (1991) presented ways to use collaborative learning or small group work with college students while Sutton (1992) discussed basic elements needed for cooperative learning groups to be successful in high school relm including "the combination of the use of team building activities, the development of good social skills, and the constant guidance from the teacher" (p.65).

At the end of the Spring Quarter 1992 the Transactional Analysis Inventory (TAI) (Gregorc, 1978) and the Test Anxiety Scale (TAS) (Sarason, 1978) were administered to the srudents as well as a questionnarie (Appendix A) regerding the activity groups. Table 1 contains the results from the Learnign Styles Questionnarie.

The data was analyzed statistically using the student's t test at the .05 significance level. The results of the t tests fo both Groups 1 and 2 for TAI showed no significant difference between the means for all the learning styles except that of concrete random in Group 1 therefore the null hypothesis was rejected for this group. However there was no significant difference between the means of all the other groups therefore the null hypothesis not rejected for these groups. There was a significant difference between the means for TAS for Group 2 (t=4.549 with 2.052 being required for significance) and there was a significant difference between the means for TAS when both Group1 and Group 2 were considered together (t=2.3339698 with approximately 2.020 being required for significance) therefore the null hypothesis was rejected concerning grouping and test anxiety.

Discussion

Use of the Transactional Analysis Inventory (TAI) by Gregorc (1978) to identify the student's style for learning was most helpful even though the differences in the pretest and posttest scores for the different styles was not significant. Perhaps the student's learning style was innate or at least learned at a very early stage and the mere grouping of students for several activities was not a strong enough stimulus to initiate a change. According to the questionnaire results most of the students agreed with the results of the TAI. Most of the students had favorable comments to make regarding working in groups especially when "taking" the review laboratory examinations.

The statistical analysis results regarding the Test Anxiety Scale (TAS) (Sarason, 1972) indicated that grouping the students so that they would be working with someone who perceived and processed materials in a different way was very beneficial to reducing their test anxiety.

It was observed by the instructor that students gained more social skills and worked together on projects after being placed into study groups. This technique prevented students from being isolated and gave them a feeling of team spirit.

Of special interest is the fact that students with the concrete random learning style showed a significant difference between the pretest and posttest scores with most of these scores being lower on the posttest. There seemed to be an increase in random learning style scores for students in both groups as compared to the first scores. The instructor (the researcher) for these students had a very high abstract random score and her presentations, even though geared to benefit all styles, may have influenced the students' learning styles. Further study is indicated.

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APPENDIX A

LEARNING STYLES QUESTIONNAIRE

Key: I= Strongly Agree, II= Moderately Agree, III= Slightly Agree, IV= Slightly Disagree, V= Moderately Disagree, VI= Strongly Disagree

Circle each answer as it best applies to you and your situation.

---

1. Finding out about my learning style was important to me.
   I II III IV V VI

2. The Galt Test helped me identify my learning style.
   I II III IV V VI

3. I agree with the results of the Galt Test or (TAI).
   I II III IV V VI

4. Working with other students of different learning styles helped me perceive the material in a different way.
   I II III IV V VI

5. The lab experiences were beneficial to me when I worked with someone who had a different learning style.
   I II III IV V VI

6. I was able to meet other students in the class much sooner yb working in small groups thar by not working small groups.
   I II III IV V VI

7. I was able to form a study group of found a study partner with whom I work outside of class oa a result of the instructor asking us to work in small groups.
   I II III IV V VI

8. Answering the review lab test questions was more beneficial to me when I worked with another student.
   I II III IV V VI

9. I prefer to study alone in the lab.
   I II III IV V VI

10. When studying the models in the lab I learned more when working with another person regardless of their learning style.
    I II III IV V VI

15

11. I learned more in the lab when working with someone whose
    learning style was different to mine.
                    I II III IV V VI

12. Working in the lab with a group of people whose learning
    styles were different to mine was beneficial to me.
                    I II III IV V VI

13. My lecture test anxiety was reduced when I worked with a
    group of people with different learning style.
                    I II III IV V IV

14. Working with someone of a different learning style helped to
    reduce my lecture test anxiety.
                    I II III IV V VI

15. Working in groups helped to reduce my pop-test anxiety.
                    I II III IV V VI

16. My pop-test anxiety was reduced when I worked with an
    individual whose learning style differed from mine.
                    I II III IV V VI

17. Working with someone of a different learning style helped to
    reduce my lab test anxiety.
                    I II III IV V VI

18. My lab test anxiety was reduced when I worked with a group
    of people with different learning styles.
                    I II III IV V VI

19. Working in groups increased my anxiety.
                    I II III IV V VI

20. I prefer to study the lecture material by myself.
                    I II III IV V VI

TABLES

TABLE 1

LEARNING STYLES QUESTIONNAIRE
RESULTS
(COMPLETED AT THE END OF THE SPRING QUARTER)

RESPONSES	I	II	III	IV	V	VI
QUESTION 1	24	21	5	1	0	1
QUESTION 2	9	26	16	5	1	0
QUESTION 3	7	23	16	6	1	0
QUESTION 4	20	24	6	3	4	0
QUESTION 5	19	17	8	6	5	0
QUESTION 6	38	9	4	3	2	0
QUESTION 7	16	7	16	6	8	2
QUESTION 8	29	15	7	2	0	0
QUESTION 9	9	8	6	16	15	2
QUESTION 10	22	15	10	4	5	0
QUESTION 11	7	15	16	12	4	0
QUESTION 12	11	21	10	8	3	0
QUESTION 13	3	8	22	18	3	0
QUESTION 14	3	8	22	18	3	0
QUESTION 15	10	13	17	8	6	0
QUESTION 16	7	13	19	11	6	0
QUESTION 17	5	20	17	8	5	0
QUESTION 18	5	16	14	9	5	0
QUESTION 19	1	4	9	17	21	1
QUESTION 20	22	8	7	9	6	1

18