This study investigated differences in two-year and four-year college students' learning styles in general education as compared to allied health education. It noted whether being a general education student or an allied health education student contributed to each student's learning style and whether being a traditional or nontraditional student in a two-year or four-year college would contribute to learning style.

Participating students from two-year and four-year colleges in West Virginia and Alabama completed the Group Assessment of Logical Thinking (GALT), which identifies learning style as concrete, transitional, or formal. General education students in the two-year college tested in the expected range. A large percentage of them, regardless of whether they were traditional or nontraditional, were concrete learners. Two-year students in the allied health fields fit into the expected ranges, as 46.14 percent were concrete learners. Among the four-year general education students, 11.54 percent were concrete learners, 34.61 percent were transitional learners, and 53.85 percent were formal learners. These numbers did not fit the expected percentages of approximately 50 percent concrete learners. When comparing traditional and nontraditional students in two-year and four-year colleges, researchers noted that there were many more nontraditional students in the two-year college than the four-year college. (Contains 13 tables.) (SM)
COMPARING TWO YEAR AND FOUR YEAR COLLEGE STUDENTS’ LEARNING STYLES IN GENERAL EDUCATION AND ALLIED HEALTH EDUCATION

Presenters:

Dr. Maryann J. Ehle
Professor, Department of Professional Education
Shotwell Hall 109
West Liberty State College
West Liberty, West Virginia 26074
(304).336.8080
E-Mail: ehlemann@wlsc.wvnet.edu

Dr. Elsa C. Price
Instructor, Department of Mathematics, Natural and Information Sciences
Wallace State Community College
Route 6, Box 62
Dothan, Alabama 36303
(334).983.3521 (272)
E-Mail: ElsaPrice@hotmail.com

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

M. J. Ehle

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION 
OFFICE OF EDUCATIONAL RESEARCH AND IMPROVEMENT
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.
Introduction

In both two year community colleges and four year colleges students attend who can be classified by ages as traditional (those students who are less than twenty-five years old) or nontraditional (those students who are twenty-five years old or older.) Both of these groups vary in their backgrounds, educational abilities and expertise, and learning styles, factors which influence the students' success in the college setting as noted by Witkinha and Goodenough (1981) and Kagan (1988.) In order assist the instructor in selecting the most appropriate presentation method for the students in a particular class, it is very helpful to assess the students' learning style. To determine and meet the students instructional needs in appropriate ways based on their learning style Stewart (1990) states that the teacher must ,"First diagnose students' learning styles, ... adapt appropriate teaching-learning components to the students' strengths and preferences;... evaluate student progress... make necessary changes" (p. 372.)

There are a variety of learning styles instruments available which the instructor can use to identify the students' learning styles and with the knowledge gained organize classroom presentations and laboratory experiences to allow for students' successful learning experiences. One such instrument, the Group Assessment of Logical Thinking (GALT) developed by Roadrangka, et.al. (1983), follows Piaget's theory of cognitive thinking. The GALT identifies the student's learning style as either concrete, transitional, or formal.

Some of the characteristics of the GALT include the following:

1. The test measures six logical operations: conservation, proportional reasoning, controlling variables, combinational reasoning, probabilistic reasoning, and correlational reasoning;

2. The test uses a multiple-choice format for presenting options for answers, as well as, the justification reason for that answer;

3. Pictorial representations of real objects are employed in all test items;

4. The test is suitable for students reading at the sixth grade level or higher;
5. The test has sufficient reliability and validity to distinguish between groups of students at concrete, transitional, and formal stages of development; and,

6. The test can be administered in one class period to a large group by individuals who serve simply as proctors (Roadrangka, et.al., 1983.)

Roadrangka, et.al. (1983) noted that as students advance in age and grades there was a general increase in cognitive ability but that "the majority of middle school students exhibit conservation skills and high school students have gained in these skills but show the same pattern of weaknesses. The majority of college students exhibit probabilistic reasoning skills" (p.9.) More than fifty percent of students interviewed and tested with the GALT were concrete learners. The following suggestions were presented which would help teachers in presenting materials to the concrete learners:

I. Organizing Information

   A. Note-Taking
   B. Obtaining material from texts
      1. Overview
      2. Identification of information/ideas
         a. sequencing of events
         b. causal relationships
         c. listing without order
         d. comparing information
         e. defining terms

II. Assimilating Information

   A. Computer Assisted Instruction
      1. Tutorials
      2. Simulations
      3. Reviews, Sample Tests, Study Guides
      4. Word processing
      5. Collecting and analyzing data

   B. Cooperative Learning (Peer Modeling)
      1. Peer Matching by Level of Reasoning Ability
      2. Time on Task
      3. Thinking Out Loud

   C. Concept Mapping
      1. Individual
      2. Small Groups
D. Problem Solving and Comprehension

1. Problem Integration
2. Problem Integration
3. Solution Planning and Monitoring
4. Solution Execution (Roadrangka, et al., 1983.)

The Study

During the Spring Quarter 1998 and Fall semester 1998 at Wallace State Community College, a two year college in Dothan, Alabama and at West Liberty State College, a four year college in West Liberty, West Virginia the Group Assessment of Logical Thinking (GALT) developed by Roadrangka, et al. (1983) was administered to student volunteers in the areas of general education and allied health education. The inventory identifies the individual as a concrete, transitional, or concrete learner. The student volunteers at the two year college were in general biology and advanced biology classes. Students in a variety of fields register for general biology while those in allied health fields register for the advanced biology only after completing the general biology class or passing a challenge examination. The general education students at the four year college were in educational psychology and models of education classes and the allied health education students were in the nursing program. The investigation was designed to answer questions regarding differences in students' learning styles as identified by the GALT when both traditional (under twenty-five years old) and nontraditional (twenty-five years old or older) students are pursuing two different educational fields.

The questions are as follows:

1. Is there a difference in two year college students' learning styles in general education as compared to two year college students' learning styles in allied health education?

2. Is there a difference in four year college students' learning styles in general education as compared to four year college students' learning styles in allied health education?

3. Did being a general education student in a two year college or a four year college contribute to each student's learning style as measured by the GALT?

4. Did being an allied health education student in a two year or a four year college contribute to each student's learning style as measured by the GALT?

5. Did being a traditional student in a two year or a four year college contribute to each student's learning style as measured by the GALT?

6. Did being a nontraditional student in a two year or a four year college contribute to each student's learning style as measured by the GALT?
RESULTS

The two year college participants were in general biology (general education) and advanced biology (allied health education) classes. There were 171 volunteers who completed the GALT in the two year college. The results of the GALT were 75 (43.86%) concrete learners, 57 (33.33%) transitional learners, and 39 (22.81%) formal learners. Of these 171 participants, 94 (55%) were in general education and 77 (45%) were in allied health education. Within the general education group 67 (71.3%) were traditional students and 27 (28.7%) were nontraditional students. Within the allied health education group 43 (55.8%) were traditional students and 34 (44.2%) were nontraditional students. Of the participants in the two year college allied health programs, 30 (38.96%) students were concrete learners, 27 (35.06%) were transitional learners, and 20 (25.97%) were formal learners (Tables Two and Three.)

There were 52 general education student volunteers in the four year college phase of the study. Of these, 45 (86.54%) were traditional students and 7 (13.46%) were nontraditional students. Of the 45 traditional students, 5 (11.11%) were concrete learners, 17 (37.77%) were transitional learners, and 23 (51.11%) were formal learners (Table Four.) Of the 7 nontraditional student volunteers, 1 (14.29%) was a concrete learner, 1 (14.29%) was a transitional learner, and 5 (71.42%) were formal learners (Tables Five and Six.) Results of the four year college allied health program students will be presented later.

DISCUSSION

The general education students in the two year college tested in the expected ranges since a large percentage of the students regardless of whether they were traditional or nontraditional tested as concrete learners. According to the authors of the Group Assessment of Learning Techniques (GALT) (Roadrangka, et. al., 1983) allied health students are typically concrete learners who learn best using science models and other hands-on activities. Those two year community college students in the allied health fields fit into the expected ranges as 46.14% (42 of the 91 subjects) tested as concrete learners. Information regarding the four year college allied health students is not available at this time.

Results of the four year college general education college students indicated that 6 (11.54%) were concrete learners, 18 (34.61%) were transitional learners and 28 (53.85%) were formal learners. These numbers did not fit the expected percentages of approximately 50% concrete learners. Perhaps these students had more experiences in testing and had developed more analytical skills since they were in educational psychology and methods of teaching classes. Studies by Ehle and Larimer (1998) indicated that a high percentage of preservice teachers were concrete sequential learners (similar to concrete) using a different learning instrument.

When comparing the traditional and nontraditional students in two year and four year colleges it was noted that there were many more nontraditional, students twenty five years old and older, in the two year college than the four year college. Considering the mission of the two year college and the economic changes within the two year college service area this would be considered normal.
SELECTED BIBLIOGRAPHY


### TABLE ONE

**TWO YEAR STUDENTS' LEARNING STYLES**  
(GALT)

<table>
<thead>
<tr>
<th>TWO YEAR STUDENTS</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=171</td>
<td>75</td>
<td>57</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>43.86%</td>
<td>33.33%</td>
<td>22.81%</td>
</tr>
</tbody>
</table>

### TABLE TWO

**TWO YEAR COLLEGE TRADITIONAL STUDENTS**  
(UNDER 25 YEARS OLD)

<table>
<thead>
<tr>
<th>GENERAL EDUCATION</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=67</td>
<td>28</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>41.79%</td>
<td>35.82%</td>
<td>22.39%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALLIED HEALTH EDUCATION</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=43</td>
<td>11</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>25.58%</td>
<td>32.56%</td>
<td>41.86%</td>
</tr>
</tbody>
</table>

### TABLE THREE

**NONTRADITIONAL TWO-YEAR COLLEGE STUDENTS**  
(25 YEARS OLD AND OLDER)

<table>
<thead>
<tr>
<th>GENERAL EDUCATION</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=27</td>
<td>17</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>62.96%</td>
<td>22.22%</td>
<td>14.81%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALLIED HEALTH EDUCATION</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=34</td>
<td>19</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>55.88%</td>
<td>38.24%</td>
<td>5.88%</td>
</tr>
</tbody>
</table>
### TABLE FOUR
FOUR YEAR STUDENTS' LEARNING STYLES
(GALT)

<table>
<thead>
<tr>
<th>FOUR YEAR COLLEGE STUDENTS</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=17.07%</td>
<td>14 17.07%</td>
<td>24 29.27%</td>
<td>44 53.66%</td>
</tr>
<tr>
<td>TRADITIONAL</td>
<td>10 14.93%</td>
<td>22 32.83%</td>
<td>35 52.24%</td>
</tr>
<tr>
<td>N=67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NONTRADITIONAL</td>
<td>4 26.67%</td>
<td>2 13.33%</td>
<td>9 60%</td>
</tr>
<tr>
<td>N=15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE FIVE
FOUR YEAR COLLEGE TRADITIONAL STUDENTS
(UNDER 25 YEARS OLD)

<table>
<thead>
<tr>
<th>GENERAL EDUCATION STUDENTS</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=45</td>
<td>5 11.11%</td>
<td>17 37.77%</td>
<td>23 51.11%</td>
</tr>
<tr>
<td>ALLIED HEALTH EDUCATION</td>
<td>5 22.73%</td>
<td>5 22.73%</td>
<td>12 54.54%</td>
</tr>
<tr>
<td>N=22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE SIX
FOUR YEAR COLLEGE NONTRADITIONAL STUDENTS
(25 YEARS OLD OR OLDER)

<table>
<thead>
<tr>
<th>GENERAL EDUCATION</th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=7</td>
<td>1 14.29%</td>
<td>1 14.29%</td>
<td>5 71.42%</td>
</tr>
<tr>
<td>ALLIED HEALTH EDUCATION</td>
<td>3 37.50%</td>
<td>1 12.50%</td>
<td>4 50%</td>
</tr>
<tr>
<td>N=8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TABLE ELEVEN**  
COMPARISON OF TWO AND FOUR YEAR NONTRADITIONAL COLLEGE STUDENTS' LEARNING STYLES

<table>
<thead>
<tr>
<th></th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWO YEAR COLLEGE</td>
<td>17</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>STUDENTS N=27</td>
<td>62.96%</td>
<td>22.22%</td>
<td>14.81%</td>
</tr>
<tr>
<td>FOUR YEAR COLLEGE</td>
<td>1</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>STUDENTS N=7</td>
<td>14.29%</td>
<td>14.29%</td>
<td>71.42%</td>
</tr>
</tbody>
</table>

**TABLE TWELVE**  
COMPARISON OF TWO YEAR AND FOUR YEAR TRADITIONAL COLLEGE STUDENTS' LEARNING STYLES IN ALLIED HEALTH

<table>
<thead>
<tr>
<th></th>
<th>CONCRETE</th>
<th>TRANSITIONAL</th>
<th>FORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWO YEAR COLLEGE</td>
<td>11</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>STUDENTS N=43</td>
<td>25.58%</td>
<td>32.56%</td>
<td>41.86%</td>
</tr>
<tr>
<td>FOUR YEAR COLLEGE</td>
<td>5</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>STUDENTS N=22</td>
<td>22.73%</td>
<td>22.73%</td>
<td>54.54%</td>
</tr>
</tbody>
</table>
### TABLE THIRTEEN
COMPARISON OF TWO YEAR AND FOUR YEAR NONTRADITIONAL COLLEGE STUDENTS' LEARNING STYLES IN ALLIED HEALTH

<table>
<thead>
<tr>
<th></th>
<th>Concrete</th>
<th>Transitional</th>
<th>Formal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TWO YEAR COLLEGE STUDENTS</strong>&lt;br&gt;N=34</td>
<td>19&lt;br&gt;55.88%</td>
<td>13&lt;br&gt;38.24%</td>
<td>2&lt;br&gt;5.88%</td>
</tr>
<tr>
<td><strong>FOUR YEAR COLLEGE STUDENTS</strong>&lt;br&gt;N=8</td>
<td>3&lt;br&gt;37.50%</td>
<td>1&lt;br&gt;12.50%</td>
<td>4&lt;br&gt;50%</td>
</tr>
</tbody>
</table>
REPRODUCTION RELEASE
(Specific Document)

I. DOCUMENT IDENTIFICATION:

<table>
<thead>
<tr>
<th>Title:</th>
<th>Comparing Two Year and Four Year College Students' Learning Styles in General Education and Allied Health Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Dr. Maryann J. Ehle and Dr. Elsa C. Price</td>
</tr>
<tr>
<td>Corporate Source:</td>
<td>Association of Teacher Educators</td>
</tr>
<tr>
<td>Publication Date:</td>
<td>Presentation 2-15-99</td>
</tr>
</tbody>
</table>

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1

☐

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only.

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only.

Documents will be processed as indicated provided reproduction quality permits.

If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) non-exclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Dr. Maryann J. Ehle

Signature

Organization/Address: West Liberty State College

Printed Name/Position/Title: Professor, West Liberty State College

Telephone: 304.336.6080 FAX: 304.336.8091

E-mail Address: mehleman@wlsc.wvst.edu

Date: 2-15-99
III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:

Address:

Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:

Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

ERIC CLEARINGHOUSE ON TEACHING
AND TEACHER EDUCATION
1307 New York Avenue, NW, Suite 300
Washington, DC 20005-4701

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
1100 West Street, 2nd Floor
Laurel, Maryland 20707-3598

Telephone: 301-497-4080
Toll Free: 800-799-3742
FAX: 301-953-0263
e-mail: ericfac@inet.ed.gov
WWW: http://ericfac.piccard.csc.com

REVIOUS VERSIONS OF THIS FORM ARE OBSOLETE.