THE EFFECTIVENESS OF COMPUTER-ASSISTED INSTRUCTION ON THE DEVELOPMENT OF RHYTHM READING SKILLS AMONG MIDDLE SCHOOL INSTRUMENTAL STUDENTS

Presented at Michigan Music Educators Conference
On Friday, January 20, 2006
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The Systems Approach to Using Software in the Classroom

- **People**
  - Middle School Instrumental Students

- **Purposes**
  - Use of instructional technologies to teach music reading skills

- **Places**
  - The classroom integration of computer instruction
  - Typical public school environment

- **Software**
  - Music Ace 2
Support for this type of study.

“In music listening and skills development, there is continued evidence that traditional CAI works relatively well when students have a clear idea of the tasks. But teachers and researchers should also look for ways to integrate and assess the hypermedia content that Bush (2000) writes about. The evaluation of this type of exploratory software needs to be done carefully and with an eye toward variables such as cognitive style and gender.” (Webster, 2002)
Reasons for choosing FDI

- FDI describes a similar cognitive process to transfer learning from one environment to another.
- FDI has been found to be a significant contributing factor to musical performance and learning. (Bush, 2000)
- FDI can be easily measured by established psychological tests.
Research Questions

1. Do students demonstrate improvement in their abilities to read and perform rhythm notation based on receiving CAI as compared to receiving no CAI instruction? (*Not the primary question, but necessary because of the need for a control group*).

2. Do students demonstrate differing degrees of improvement in their abilities to read and perform rhythm notation based on differences in scores on the Group Embedded Figures Test?

3. Is there a relationship between student cognitive style as indicated by FDI and the effectiveness of CAI to teach rhythm reading and performing skills to middle school students?
Methodology

- **Population**
  - A suburban middle school in central Illinois.
  - 180 Students enrolled in band and orchestra.

- **Sample**
  - 120 students enrolled in band and orchestra.

Treatment

- **Music Ace 2**
  - Rhythm lessons (beat and tempo, hearing rhythms, the quarter rest, the measure, syncopation, sixteenth notes, three sounds per beat, the time signature, 6/8 time signature.

- **8- ½ sessions once a week for 8 weeks**
  - The length of treatment was extended to make sure all subjects received 8 sessions.
Independent Variables

- Grade (6, 7, 8)
- Field Dependence/Independence
- Experimental and Control groups
  - CAI, Music Ace 2
  - No CAI, students remained in ensemble rehearsals

Dependent Variable

- Rhythm Performance Scale
- 5 impartial raters
## ANOVA Factorial Design (GRB-2)

### Summary Table: Tests of Within-Subjects Contrasts, RPS Pretest and RPS Posttest

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
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<th>Mean Square</th>
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<th>Observed Power</th>
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*: p < .05
Comparison of RPS Scores by Grade

Estimated Marginal Means

Pretest Posttest

Gr.

DIFFRNCE

1

2
Comparison of RPS Scores by Group

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
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<td>30</td>
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<tr>
<td>Experiment</td>
<td>32</td>
<td>32</td>
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</tbody>
</table>

**Estimated Marginal Means**

- Pretest: 22, 32
- Posttest: 30, 32

**Graph:**
- Group 1: Control (22), Experiment (32)
- Group 2: Control (30), Experiment (32)

**Legend:**
- Red square: Group 1
- Green square: Group 2

**Axes:**
- Y-axis: Estimated Marginal Means (22 to 32)
- X-axis: GROUP
  - Control
  - Experiment

**Legend:**
- 1: Group 1
- 2: Group 2

**Legend:**
- Pretest
- Posttest
Comparison of RPS scores by GEFT quartile

Estimated Marginal Means

Pretest
Posttest

QUARTILE

DIFFRNCE
1
2
### Summary Table: Tests of Between-Subjects Contrasts, RPS Pretest and RPS Posttest

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<th>Source</th>
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*: p < .05
### Post hoc multiple comparisons by GEFT quartile

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<td>8.68*</td>
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<tr>
<td>3</td>
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<td>-</td>
<td>1.82</td>
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<tr>
<td>4</td>
<td>-13.03*</td>
<td>-8.68*</td>
<td>-1.82</td>
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</tbody>
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### Post hoc multiple comparisons by grade

<table>
<thead>
<tr>
<th>Grade</th>
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<th>8</th>
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<tbody>
<tr>
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<tr>
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<td>8.95*</td>
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<tr>
<td>8</td>
<td>13.97*</td>
<td>5.02</td>
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</table>
Student approval of using rehearsal time for CAI

- Yes: 39 students
- No: 18 students
Student attitude toward Music Ace 2

I liked it a lot: 16
I liked it: 13
It was ok: 22
I disliked it: 3
I disliked it a lot: 0
Conclusions

- There are significant differences in the ability of students to perform written rhythms based on GEFT scores and grade.
- This study illuminated specific difficulties of conducting experiments in a school environment. (attendance and attitude).
- Student attitude overall appears to be positive toward the use of computer instruction.
- The findings support the recommendation by Webster (2002) that research needs to continue to study the relationship of learning style and the use of computer-technology in the classroom.
Conclusions

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References


