A Review

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ARCADE STYLE SOFTWARE
FOR YOUR MICRO: A REVIEW OF
DLM'S ARCADEMIC SKILL BUILDERS FOR
MATH AND LANGUAGE ARTS

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The Arcademic Skill Builders series in
math and language arts provides an
imaginative electronic video arcade
style to drill and practice. The
language arts and math series each
contain six different programs. Each
package contains a fast action program
with colorful graphics in an arcade
format, supplementary worksheets,
flashcards (math only), record keeping
sheets, and progress charts. Arcademic were designed by Jerry
Chaffin and others at the University
of Kansas.

The developers' rationale was to make
elements of classroom instruction as
motivating as arcade games.
Underlying assumptions guiding the
design of Arcademics are clearly
expressed. Success in learning is
reflected in student improvement,
rather than merely preventing the
student from making mistakes. High
rates of responding are built into the
program as fluency is central to the
operation of these programs. The
authors clearly state that student
motivation is encouraged through
improvement in performance over
time (learning), fast action (high
frequency of responding), and
increasing levels of difficulty.

Each program follows a unique game
format. In Verb Viper, the player
feeds the dragon the correct tense of
verbs coming from caves to match the
subject on the pad underneath. In the
case of Word Invasion, the player
helps Alien Octopus aim at and fire
down words representing parts of
speech (nouns, pronouns, verbs,
adjectives, adverbs, and/or
prepositions). Players fire from a
star station in order to disintegrate
uncoming meteors by answering

multiplication of numbers 0 through 9
in Meteor Multiplication. Apples are
fed to alligators in a swamp by adding
and subtracting numbers 0 through 9
in the game Alligator Mix. A record
displays the high, low and current
scores at the end of each game.
Scores are recorded as hits and
misses. See Table 1 for a complete
listing of Arcademic Skill Builders.

Arcademic Skill Builders provide a
broad range of skill levels in an
attempt to individualize the
instruction and make the programs
useful to children in grades three
through six. This is accomplished
through the use of built-in program
control options. All games have
control options which may be used to
adjust speed, content, reading and
vocabulary levels, and running time.
Speed of stimuli presentation may be
adjusted from 1 to 9. The content
adjustments are specific to each game;
one must refer to the game reference
card or manual. One may also adjust
the difficulty of the reading and
vocabulary levels from approximately
grade one to beyond grade three.
Games may be from one to five minutes
in duration. Players may use keyboard
commands or game paddle controls.
Games may be played with or without
arcade sound effects.

The basic philosophy of Arcademics is
clearly stated in the manual. First,
repetitious drill and practice can be
fun and stimulating. Students respond
to challenge, and, in this
microcomputer software series, errors
are viewed as opportunities to improve
rather than as indications of failure.
The rate of stimuli presentation
imposes no ceiling on student
performance. Feedback which is
incorporated into the program will
assist students in implementing
performance and instructional
strategies which facilitate
improvement.

The suggested strategy for student
placement into the program is to start
students "where they aren't" and step
forward or backward as necessary. A
specific procedural approach or
teaching strategy is outlined in all
Arcademic manuals: (1) establish aims
for students; (2) explain procedure to
students; (3) monitor and record
student progress; (4) chart student

TABLE 1  
ARCADEMIC SKILL BUILDERS IN LANGUAGE ARTS AND MATH

<table>
<thead>
<tr>
<th>NAME</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>LANGUAGE ARTS</strong></td>
<td></td>
</tr>
<tr>
<td>Word Invasion</td>
<td>Parts of Speech: nouns, pronouns, verbs, adjectives, adverbs, and prepositions</td>
</tr>
<tr>
<td>Verb Viper</td>
<td>Correct tenses of verbs</td>
</tr>
<tr>
<td>Word Master</td>
<td>Antonyms, synonyms, and homonyms</td>
</tr>
<tr>
<td>Word Radar</td>
<td>Sight words</td>
</tr>
<tr>
<td>Spelling Wiz</td>
<td>Spelling</td>
</tr>
<tr>
<td>Word man</td>
<td>Initial consonants and long and short vowels</td>
</tr>
<tr>
<td><strong>MATH</strong></td>
<td></td>
</tr>
<tr>
<td>Alien Addition</td>
<td>Addition of numbers 0 through 9</td>
</tr>
<tr>
<td>Minus Mission</td>
<td>Subtraction of numbers 0 through 9</td>
</tr>
<tr>
<td>Meteor Multiplication</td>
<td>Multiplication of numbers 0 through 9</td>
</tr>
<tr>
<td>Demolition Division</td>
<td>Division problems with answers 0 through 9</td>
</tr>
<tr>
<td>Alligator Mix</td>
<td>Adding and subtracting numbers 0 through 9</td>
</tr>
<tr>
<td>Dragon Mix</td>
<td>Multiplication of numbers 0 to 9 and division problems with answers 0 through 9</td>
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</tbody>
</table>
progress; (5) interpret student progress; (6) establish strategies for improvement; and (7) set new aims. Aims are set for number of hits and misses by a designated date. The authors recommend that no aim be set at less than 40 hits and no more than two or three misses per two minute game. Students should be actively involved in aim setting. Student progress is charted on a two cycle semilogarithmic graph with room for 70 calendar days. Ten visuals of learning pictures with suggested teaching strategies are included in the manual. Blackline masters of the Student Record Sheet, Progress Chart, and Strategies for Improvement Sheet are included in the packet.

The authors recommend that the Skill Builders be linked to the elementary school curriculum and used to introduce and/or reinforce concepts. Software content is an integral part of the elementary school curriculum. The programs would be appropriate for most elementary school students beyond the second grade. Additionally, the programs could also be used by junior and senior high school students who are experiencing difficulty in the content areas. Program manuals list many ways to link the software to related activities. Blackline masters are included for all skills and each level of skill difficulty. These practice sheets look very much like those developed by Precision Teachers over the years, with many response opportunities and response counts on the right margins. Flashcard sets are included in the math programs.

COMMENTS: Arcademic Skill Builders clearly offer an alternative for those who are shopping for drill and practice microcomputer software appropriate for the math and language arts elementary school curriculum. To this reviewer’s best knowledge, this is the only frequency-based software currently on the market. It clearly utilizes the fundamental elements of Precision Teaching. The arcade style, including high frequencies, certainly makes the games exciting to play. The games are highly sought after by students—young and old!

The control option built into all programs is very practical and provides much flexibility for using the programs under various conditions. Teachers and/or students may vary content, difficulty level, speed of play, running time, and whether or not sound and/or game paddles are used in each program. However, no provision is made for adding new content.

A great deal of variability exists in speeds between programs. The author completed 4 levels of six programs 10 times. The median number of responses for each level of each program is shown in Charts 1 and 2. In Alligator Mix the response ratio for level 7 to level 1 is approximately a x4, and the response ratio in Verb Viper at the same level is less than x1.8. Therefore, the same speed levels across programs do not reflect the same response quantities.

A black and white monitor as well as a color monitor were used to review the program samples. Although the color was more aesthetically appealing, playing the games in black and white was not a detraction and was just as exciting. Once control functions are set or default values used, the disk may be taken out of the drive and used elsewhere. All programs operate on a single boot system. This is a tremendous advantage where multiple use is required. The option of running the program without noise in a classroom setting is a real asset to most practitioners. Current score, low score and high score are provided at the termination of each game. Scores recorded are only "counts" and are not transformed to frequencies. As a result, highs, lows, and currents will be much different when the game length (counting period) is changed.

Users of Skill Builders must be aware that game participation and scores measure more than just the language arts and math content. A certain amount of hand-eye coordination, dexterity and fine motor control are required to obtain high scores at high speed levels. There is also some variability between scores on the same game, with the same content, and at the same speed and difficulty level when the play option of keyboard or game paddle is elected. Additionally, the error goal of two or three misses in a two minute game, as stated by the authors, may be very unrealistic when students are using high speed level
Chart 1. Performing Arcademics Math

Alligator Mix:
Levels 1, 3, 5, 7

Meteor Multiplication:
Levels 1, 3, 5, 7

Demolition Division:
Levels 1, 3, 5, 7

(median correct frequency for ten timings)
Chart 2. Performing Arcademics Language Arts

Verb Viper:
Levels 1, 3, 5, 7

Word Invasion:
Levels 1, 3, 5, 7

Word Master:
Levels 1, 3, 5, 7

(median correct frequency for ten timings)
options and going for high scores. Errors in keyboard entry and/or paddle board coordination often occur during a game. The important factor may be the ability of the student to demonstrate knowledge of that basic fact with a quick self-correction.

The authors indicate that errors are learning opportunities and students should feel free to make errors during game play. Strategies recommending how to improve performance and learning through teaching to the errors are outlined in the manual. However, specific errors made during the course of a game are not recorded or indicated in any manner. The student is provided an error count but not a listing of the specific errors. Even at the termination of a one-minute game, one does not remember the specific errors made during play. This makes it difficult to employ a "teach to the errors strategy" unless someone else can record or verify errors. For this reason, it may be helpful for students to work in pairs— one student as player and another as recorder.

A glut of poor to useless microcomputer software is currently in the marketplace, and much of it has found its way into educational settings. Arcademic Skill Builders in Math and Language Arts provide a clear alternative to what currently exists in drill and practice packages. Students really do enjoy playing the games. Approach responses to Arcademics are very strong as players always want to do one more. Most drill and practice software is painfully slow and imposes very low response ceilings on students. The action can be very fast in Arcademics. The control options make the programs very affordable, applicable and adaptable for users. The documentation and support materials which explain rationale and procedures are excellent. Actual game operation directions are somewhat sketchy, but they can be easily figured out. See Table 2 for additional information.

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**TABLE 2**

<table>
<thead>
<tr>
<th>DLM Arcademic Skill Builder Information</th>
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<tbody>
<tr>
<td>HARDWARE: All 12 programs are compatible with Apple II and IIE, as well as Commodore, IBM PC and Atari 400, 800 and 1200. Programs published before October 1983 may not be compatible with all these systems. DLM will work with customer replacements.</td>
</tr>
<tr>
<td>SOURCE: Developmental Learning Materials One DLM Park Allen, Texas 75002</td>
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<td>COST: $44 per program</td>
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<tr>
<td>BACK-UP: Defective disks replaced at no cost within six months of purchase. After six months disks can be replaced for $20 each.</td>
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</table>

What effects will Arcademics have on students' learning in your classroom? The authors suggest research was conducted in the form of a developmental or pilot study. However, no data or references are included in the manual. Therefore, the aforementioned question remains an empirical one. I think that you will certainly want to give them a try. For all the shortcomings the programs have, they may very well be the best drill and practice software on the market and the only frequency-based software designed to ensure many painless student trials in these curricular areas.

**About PT**

**NOTES FROM THE EDITOR**

Patrick McGreevy

Welcome to Volume V of JPT. First of all, I would like to thank you for