NUTRITION EDUCATION SOFTWARE

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Framingham State College has recently conducted several projects involving the application of nutrition software for microcomputers. The one I will discuss is an evaluation of nutrition education software for use in public schools. This project was funded under the Nutrition Education and Training Program through the Bureau of Nutrition Education and School Food Services of the Commonwealth of Massachusetts Department of Education. The project has involved faculty and senior nutrition majors at Framingham State College and elementary, middle and high school teachers and students in the Framingham Public Schools and two other local school systems.

The purpose of the project is to provide public school teachers and nutrition educators with a resource guide to selecting nutrition education software. Educators are faced with limited budgets for software and limited information on which to base their choices. Most software producers do not permit preview of their programs nor can the software be returned if the buyer is dissatisfied with the content. These policies protect the producer from unauthorized copying but they also impede the process of providing accurate and useful nutrition education software in the classroom.

Computers have a great deal of potential in nutrition education. Nutrition is a multidisciplinary subject area and as a result may be taught as part of a number of different courses in schools. Nutrition is included in general science, biology, chemistry, health education, physical education, and home economics. It would be unusual for a teacher in any of these subject area to have more than one if any college courses in nutrition. As a result the teachers have a varied and often limited knowledge of nutrition subject matter. The computer can be very helpful in increasing the accuracy of nutrition content in these courses. The computer can also provide more depth of nutrition information than is usually available in schools by calculating individual Recommended Dietary Allowances, activity levels and dietary information. This, of course, depends on the accuracy of the programs. It is very difficult for teachers to evaluate accuracy although they are very good evaluators of the instructional value of software. In this project, nutrition professionals evaluate the scientific accuracy of the programs and the teachers and their students help us evaluate the educational value of the software.

Approximately forty pieces of software are being evaluated for the accuracy of their nutrition content and their usefulness as a teaching tool. The evaluation form used is the "Microcomputer Software Evaluation Instrument" published by the National Science Teachers Association. This instrument meets the need for evaluating software that might be used in a number of subjects areas. This instrument was selected in part because it provided an option for adding criteria for specific nutrition content Each piece of software is first evaluated for scientific accuracy by faculty and senior year majors in nutrition. The nutrition students conduct the evaluations as part of the requirements in the course "Computer Applications in Dietetics". These students have been able to detect a number of inaccuracies, discrepancies and misleading statements that might not be recognized by classroom teachers. The software being evaluated is limited to those programs with nutrition education content. Programs that provide only nutrient analysis have been evaluated in a previous project by Dr. Charlene Hamilton of Framingham State College.

Software that meets a minimum standard for accuracy, set at six out of a possible ten points, is then evaluated for classroom use. Up to this time these evaluations have been conducted in two ways, teacher evaluations during workshops and teacher evaluations during actual classroom use. At the elementary level software has been made available to teachers during inservice workshops on software evaluation conducted by the Framingham Public School System. These workshops are provided for teachers so that they may become familiar with a variety of types of educational software. The Framingham Public Schools use computers extensively in the classroom and teachers are experienced and critical evaluators of software. Nutrition students were available during these evaluation workshops to assist the teachers. Some software for elementary school was also evaluated with students but this was limited to schools that had computer laboratories where a number of students could work at one time.

At the middle school level (sixth, seventh and eighth grades) software was evaluated in the classroom by teachers and students. A nutrition student or faculty member participated in the presentation and evaluation of the software in the classroom. All but one of the evaluations in the middle school took place in a home economics course. One evaluation was part of a sixth grade general science program. The input of the middle school students in these evaluations was very helpful.

At the high school level software was evaluated by teachers and students as part of a food and nutrition course. The teacher in the course holds a master of science degree in nutrition and computers are used extensively in the course.

The teacher and the students wrote detailed evaluations and they were able to make useful comparisons of software with similar content.

We are finding that the quality of nutrition education software varies a great deal. This is true of educational software in general. Software is often poorly designed and difficult to use. Unfortunately poor software discourages computer use by both teachers and students. Software production is a very fast growing business. Often good computer programmers lack knowledge of educational principles and the content area and may produce programs that do not fit into the curriculum or the educational philosophy of the teacher. On the other hand, educators who write programs that have a good instructional basis may be so unsophisticated at programming that their software may have little motivational value and may not utilize the unique educational capabilities of the computer.

The computer offers some unique educational advantages. For example, immediate feedback can be given on both correct and incorrect responses to questions. A management system can be programmed to provide the teacher with a record of students' progress on the computer. Tutorials can be used that can branch to different information depending on the students skill level determined by responses to questions. The computer is infinitely patient and can therefore provide drill and practice for as long as necessary. Animated graphics can be motivational and a good teaching aid. However, the use of integrated computer and videotape instruction will probably improve on animated graphics. The computer is particularly well suited for carrying out tedious calculations inherent in dietary and energy analysis.

The value of the computer as a teaching tool is limited, however, by the quality of the software. Some software is written to be no more than an electronic textbook or "page turner". The student reads information off the screen and does little more than press a key occasionally. This type of program is a poor use of computer time. Another problem with reading from the screen occurs when the reading level required is higher than the grade level of the content area. We found several programs that had nutrition content typical of lower elementary grades but required a fifth or sixth grade reading ability. Some programs require fairly advanced keyboarding or typing skills. Words need to be typed and spelled correctly,a time consuming and frustrating task for some students. This happens particularly in programs that seem to focus on extraneous skills like word scrambles and crossword puzzles. There are several program design factors that make a program either "user friendly" or frustrating. The program must allow correction for errors in typing, it should not "crash when an incorrect key is

inadvertently pressed and it should allow the user to exit a portion of the program without rebooting.

Nutrition educators have an important challenge in improving the quality of nutrition education software. Nutrition content in school curricula is fragmented partly because it crosses many subject areas. Teachers do not have clear guidelines for appropriate nutrition content at each grade level. While most subject areas have an accepted scope and sequence throughout the grade levels, nutrition units tend to have the same information repeated year after year and many important areas not included at all. This curriculum problem is very evident in nutrition software. For example, software appropriate for second graders focuses on understanding the five food groups, placing foods appropriately in the groups and evaluating a days diet based on food groups. This same type of activity is repeated at every grade level including twelfth grade in some of our software. It would seem logical to develop some type of sequence that would recommend evaluation by food groups through fourth or fifth grade, then move on to a focus on nutrients and nutrient needs and issues in nutrition and health.

In conclusion, computers have great potential in nutrition education. This potential is limited by the accuracy and appropriatness of the nutrition content and the quality of the programming. Nutrition educators need to become actively involved in the development of excellent nutrition education programs.

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Nutrition Education Software Evaluation Project

Software List

Daily Menu Analyzer	Orange Juice Software Systems	$145.00
Disappearing Dinner	Marshware	$24.95
Eat for Health	Genesee Int.School District	$40.00
Fast Food Micro-Guide	The Learning Seed	$49.00
Fatjack	The Learning Seed	$49.00
Food and Fitness	University of Idaho	$10.00
Food Encounters	National Dairy Council	$40.00
Food Facts Fun	Scott, Foresman	$49.95
Food for Thought	Dietary Data Analysis	$39,95
Food for Thought	Marshware	$39.95
Food Group Puzzles	Marshware	$39.95
Grab a Byte	National Dairy Council	$40.00
Grease	Dietary Data Analysis	$27.95
Heart Anatomy and Physiology	American Heart Association	$9.00
Home Food Storage	University of Idaho	$10.00
Jumping Jack Flash	Dietary Data Analysis	$34.95
Menucalc	The Learning Seed	$39.00
Munchies	Dietary Data Analysis	$34.95
Nuti-Bytes	Center for Science in the Public Interest	$29.95
Nutraraid/Nutrapuzzle	Dairy,Food and Nutrition Council	$30.00

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Software List Continued

Nutri-Venture	Kellogg Company	$25.00
Nutrient Data Bank	The Learning Seed	$49.00
Nutrition a Balanced Diet	Educational Materials & Equip.	$39.00
Nutrition Express	Center for Sci.in Pub. Inter.	$39.95
Nutrition Pursuit	The Learning Seed	$49.00
Nutrition Simulation	EMC Publishing	$89.00
Nutrition Tutorial	EMC Publishing	$89.00
Nutrition Vol 1	MECC	$49.00
Nutrition Vol 2	MECC	$49.00
Nutrition/Game Format Study Aid	Orange Juice Software Systems	$45.00
RISKO	University of Idaho	$10.00
Salt and You	MECC	$39.00
Salty dog	Dietary Data Analysis	$27.95
Snackmonster	The Learning Seed	$49.00
Sweet Tooth	Dietary Data	$27.95
The Salt Shaker	The Learning Seed	$49.00
To Salt or Not to Salt	Orange Juice Software Systems	$110.00
Understanding Food Labels	The Learning Seed	$49.00
Vegetarianism	Julie Grannell	$20.00
Weightcalc	The Learning Seed	$49.00
What I Usually Eat	National Dairy Council	$20.00
What's in Your Lunch	Lawrence Hall of Science	$24.95
You Are What You Eat	Marshware	$39.95