HEALTH EDUCATION: AN INTERACTIVE LESSON

By

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HEALTH EDUCATION: AN INTERACTIVE LESSON

Abstract

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The purpose of this paper is to explore technology use within the health education curriculum and to describe the development of a compact disc (CD) for use in health education classes. This health education CD was created as a self-study module for students in grades four through six. It is a supplement to the traditional classroom health education curriculum. The compact disc is designed to enhance learning about nutrition and physical activity by means of an interactive and fun computer-based approach. It will enable students to learn in an independent manner, while practicing their math, reading, comprehension, science and computer skills. The goal of this compact disc is to motivate children to take an active part in living a healthy lifestyle. The compact disc is based on the health belief model and the National Health Education Standards. Technology advances, such as this compact disc, provide educators another way to incorporate health education into the classroom.
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Introduction

Imagine having students eager to learn about health education, independent in advancing through lessons and having a better understanding of what they are learning. This is the reality for some students who have experienced the use of technology as a teaching tool for health education. Health education instruction commonly uses traditional classroom techniques instead of more advanced multimedia approaches. Research has shown that children learn better when interactive teaching tools are utilized.¹ To become healthier members of society, school aged children need to be able to learn about health and nutrition in a fun and motivating manner. Children need to be more independent in making healthy choices and being active. Providing education using computer assisted instruction (CAI) is a priority for and a possible deficiency in, the elementary school health education curriculum. The purpose of this paper is to explore the benefits and drawbacks of using computer assisted instruction in the elementary school setting and to look at various ways technology is used to teach health education. In addition, development of an interactive health education lesson on CD for fourth to sixth grade students is described.

Overweight and Physical Activity

Within the United States, 16 percent of children between the ages of 6 and 19 years are considered overweight. This is more than triple the number of overweight children than was reported in 1980. Today, more than 9 million children in the United States are overweight.² Forty-five percent of children do not have enough physical activity during the day.³ A lack of physical activity leads to obesity, heart disease and many other co-morbidities. Heart disease is the nation’s leading cause of death and is
responsible for 30 percent of all deaths in the United States. \(^1\) Due to these high numbers and serious health concerns, now is the time to focus on the children's health and nutrition. By making this a high priority, there is a greater chance of preventing chronic health problems in adulthood such as heart disease and other conditions associated with obesity.

The high rate of obesity is due in part to limited parent and child knowledge of the importance of nutrition, exercise and living a healthy life. Children need to be motivated to take part in their health and to be an active part in the balance of food intake and activity. Since poor health habits are established during childhood and continue on into adulthood, \(^1\) children need to learn at a young age how to lead a healthy lifestyle. This learning should occur both at home and at school. This is a challenge because unhealthy kids (kids that need the education the most) attend school less. Children need to be healthy enough to be able to attend school and learn the needed health related skills. \(^4\)

**Schools and Health Education**

Schools are the optimal site for health education because they teach basic skills needed to create health such as decision-making, problem-solving, critical thinking, communication, self-assessment and coping skills. \(^4\) However, only 13 states require health education training for teachers. Eighty percent of states require health instruction in the classroom and only 3.8 percent of health instruction is taught by health education specialists. \(^1\) Therefore, there is a nation wide deficit of quality health education that may negatively impact the future health of our children. A huge challenge exists to teach children the required health knowledge without properly prepared teachers who
have special training in this area. Even though eighty percent of the states require health education, only 15.7 percent of states require student health education testing. Current practices in health education are based on more traditional teaching methods including lecture, assigned readings and handout based activities. Traditional teaching has many drawbacks and challenges. These challenges include lack of appropriate resources available for children with emotional, physical or learning disabilities or children whose primary language is not English. It is also very difficult to keep classroom books and handouts up to date. Textbooks are very expensive and school funding is not adequate, making it ever more difficult to purchase education materials. Lack of up to date materials is a barrier that decreases the overall quality of health education.

A study of 233 fifth grade students found that some of the barriers to health education are the limited time children spend in school, lack of educational resources and insufficient teacher training in the area of health education. The result of some of these barriers is that a majority of elementary school children do not receive health education at school. These findings led to the development and implementation of a web based education program in one school district. The outcomes of this program were an overall increase in physical activity and an increase in knowledge and attitudes towards physical activity. This program was developed and implemented in a short time period using technological advances common in education today. Internet based education can be developed quickly and updated easily. Although technology is slowly making its way into the elementary school classroom, it is not widely used for health education at this time.
Technology and Health Education

The use of technology in the classroom began in the 1960s with the use of audiovisual instruction based on the communication theory. The first technology was a 16 millimeter projector used for stimulation type teaching. It was called the Plato and Socrates System of education. During this time there were many fears, concerns and unrealistic expectations about the use of instructional technology. It was found that after using the technology for just 45 minutes, these concerns and fears were greatly reduced. By 1993, web based education was becoming popular. Web-based learning is a method of learning that uses the technology of the internet for teaching. By 1999, one out of every 14 college students had taken online courses. Today, technology is everywhere. In fact, 92 percent of schools have internet access in the classroom.

Traditionally, some educators have taught health education using non-technological methods, including lecture, literature review and discussion. The current trend in education is the use of various forms of technology combined with non-technological teaching styles. This technology includes CAI and web-based instruction. CAI or computer assisted instruction is a system of instruction that is performed entirely on a computer. CAI allows active participation, is behaviorally based and allows for intense instruction time. Students are able to progress at their own pace, while utilizing multiple instruction techniques at once. CAI’s also allow for immediate self evaluation which increases the students understanding throughout the learning process. Some other aspects of CAI include:

- Using pre-tests to assess baseline knowledge and skills.
- Easy navigation through the educational material.
• Learning activities that are repetitive to increase student understanding and knowledge
• Enjoyable learning by using game based instruction
• Using post-tests and quizzes to assess learning
• Students can navigate through a series of CAI’s that build on each other.
• Objective data including test scores to evaluate student progress.¹⁰

Lecture and note taking as methods of health education are being replaced by interactive and computer based technology. As technology becomes more widely used, it will have a huge impact on the roles of the teacher, student, administrator and the schools. Course instruction will vary greatly but will have the common thread of technology.⁶

A study of 109 freshman students in North Carolina concluded that by using a CAI based health education program, test scores were 28 percent higher in the group that used the CAI compared to the lecture group. The CAI that was used consisted of 5 modules, a teacher’s guide, background information, a test bank and technical assistance.⁹

A study of 27 middle-school students concluded that by using modern technology such as the internet for health education, children were more involved and had a greater understanding of basic health education concepts.¹¹ It was also found that teachers were better able to adjust their content to be developmentally appropriate and more able to promote independent learning within the classroom. This study showed that by using the internet as a supplement to traditional education techniques, more student
teacher interaction was created, children learned at their own pace and overall learning was enhanced.

Another study of 33 female students suggested that by using a CD-ROM as a supplement to traditional education, students have more opportunity for cognitive processing. This study concluded that 93 percent of students found the CD helpful and would recommend it to others. The CD-ROM was determined to be helpful because students had quick access to information, could work at their own pace and the CD-ROM captured the student's interest. Improved cognitive achievement and educational participation is directly correlated with technology based health education. Computer assisted instruction yields greater comprehension and integration of health related information by students than traditional classroom instruction.

The benefits of computer assisted instruction are similar to that of web-based instruction. Computer assisted instruction (CAI) demands involvement from the students. Students are responsible for their own learning and must take an active role in the learning process. Learning is self-paced and student centered. The information presented is consistent and accurate. The teaching is non-judgmental and yields shorter learning times with longer and larger knowledge retention. According to a study by Beard, Harper and Riley in 2004, computer instruction can offer students the chance to discover their strengths and weaknesses as learners and work towards being an optimal learner. High quality education and technology based education are not separate concepts. Along with computer assisted instruction is the concept of online or web-based learning.
Online learning is an “educational philosophy for designing interactive, responsive, and valid information and learning opportunities to be delivered to learners at a time, place and in appropriate forms convenient to the learners.” Web based programs require minimal expertise and training for teachers. Because many resources exist for teachers related to online learning, programs can be quickly developed and implemented in the classroom. Use of online learning resources might contribute to improvements in health related knowledge, attitudes and behaviors of school aged children. Online learning is efficient and a key component of health education.

There are several benefits of web-based and technology-based learning. Students do not have to learn at the same speed as the rest of the class, but can spend as much time as needed on any specific task or concept. Students receive prompt feedback while learning with online activities. Diverse learning approaches are used online and expectations for learning can be known prior to the start of each lesson. Web based technology also assists in the active learning process by increasing the availability of learning resources, the time these resources are available and at a rate the student prefers to learn. Students are also able to take breaks when needed. Because web-based technology uses the knowledge building approach, students can apply learning to more than one subject. “Internet-enhanced education can be incorporated into traditional curricula if the technology is integrated with classic educational pedagogy in mind.”

Currently, more and more internet websites, computer-based learning tools and interactive instructional materials are being developed in the area of health education. These new developments such as computer assisted instructional programs are just
some of the advances that can be used in the traditional classroom. Because face to face education is expensive; \(^8\) web-based health education is a cost-effective investment in the future of our children.\(^4\) These types of program support tools have a positive effect on the success of the students.\(^{15}\)

Some of the main challenges of computer assisted instruction and web-based instruction are related to the perceptions, attitudes and fears of teachers. A small number of teachers believe that technology integration is problematic, costly and unreliable. These teachers are concerned about a lack of technology related training and technical support. These teachers feel that they do not have support when challenges come up. Some teachers do not see the value of using technology and are concerned that computer assisted instruction is only going to be temporarily popular.\(^{16}\) This is a barrier to the institution of computer based instruction. Other barriers to technology use include lack of education and difficulty in implementing technology based education. Teachers do not know where to start.\(^{17}\) Implementing technology is a big change for some, but a barrier that can be overcome with education, practice and time for adjustment.

One possible solution to technology implementation is to create a roadmap. By creating a roadmap, teachers are able to visualize the implementation process and start the personal process of adapting to change. This roadmap should include a final destination and a path to this destination that includes tools, support needed and checkpoints. This road map can also include classroom organization strategies, a timeline and possible barriers that might alter the end outcome. This map should be developed over time and when finished should provide a clear vision for technology
A roadmap is a visual guide to unknown territory. It might help to reduce anxiety and can be applied to various aspects of technology integration.

Overall, there is a great need for additional technology based health education. The schools are the optimal arena to integrate this type of education. This technology can be implemented slowly to allow teacher and student adjustment. Health education today is compromised by lack of use of resources and properly trained teachers. The internet and other computer assisted instruction is cost effective and allows students to learn in an independent manner from resources that give accurate and timely information. Technology-based learning resources can be created that are developmentally appropriate and are useful in various settings. By educating children about health today, there is hope for prevention of poor health outcomes in the future.

Project Summary

Research shows that children learn better when technology is used within the classroom and that schools are an optimal arena to incorporate this type of technology. The purpose of this project was to create a health education compact disc (CD) with web-based components and to pilot test the CD with content experts including 4th to 6th grade teachers and students. This developmentally appropriate interactive compact disc (CD) includes basic concepts of health education, including nutrition and exercise. The CD is targeted towards the fourth to sixth grade population and includes links to educational internet websites, numerous learning activities and quizzes. Students can use the CD with minimal assistance from the teacher and the teachers can integrate the CD activities into their traditional health education lessons. The content of the CD is
based on the National Health Education Standards\textsuperscript{18} as well as the goals of the Healthy People 2010 campaign.\textsuperscript{19} The CD was designed using the Health Belief Model (HBM) conceptual framework.

### Conceptual Framework

"The Health Belief Model is a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals."\textsuperscript{20} This model focuses on preventative health care practices, compliance and weighing the perceived threat of disease against the value of preventative action.\textsuperscript{21} This CD focuses on the aspect of value related to exercise and nutrition.

During the school-age years children are in Erikson's developmental stage of industry versus inferiority.\textsuperscript{22} During this stage children are trying to develop their sense of self worth. This includes refining the skills they have previously learned. The goal of this CD is to provide education that will increase the likelihood that children will practice healthy eating habits and increase their daily amount of physical activity. The students will also better understand the seriousness and susceptibility to disease processes and health problems associated with the lack of physical activity and poor nutritional habits and have an increased understanding of the benefits of good nutrition and physical activity. This CD will gives the students interactive opportunities to engage in active learning related to living a healthy lifestyle and includes skills such as making healthy food choices and taking part in physical activity.

The HBM also includes the concept of self-efficacy. This is the belief about being able to continue the practice of the newly learned skills.\textsuperscript{18} The material on the CD is presented in a motivational manner and includes fun learning activities that will enable
the students to learn the material and become more self-confident in using their newly
gained knowledge.

Methods

This CD was created to be developmentally appropriate and easy to use. Flesch
Reading Ease and Flesch-Kincaid Grade Level scores were used to ensure that the
information was written below the fourth to sixth grade reading level. The Flesch
Reading Ease Score indicates the average number of syllables per word and the
average number of words per sentence. The CD was written at the third grade level.
The Flesch-Kincaid Grade Level Score used the same data, but translated the result to
a grade level. The target score for this test is 3 to 3.9, which is the third grade level.
The reading level is lower than the target population grade level to ensure ease in
reading.

The CD is programmed to auto run when inserted into the computer. This will
allow the students to begin use quickly and without numerous steps. Using Power Point
Viewer, the students will be able to work through each section of the CD. Each section
includes three activities and a quiz. Also included is a section for the teacher with
answers to the quizzes and lists of useful resources related to health education.

The first section of the CD is a lesson on exercise and covers the definition of
exercise, types of exercise, importance of exercise and daily exercise
recommendations. The section includes two activities designed to allow students to
create their own physical activity and to find fun forms of exercise within the community.
The exercise section is pulled together with a four question quiz to test the learning and
understanding of the students. The second section of the CD describes the food guide
pyramid and teaches students to make healthy food choices by participating in web-based games, puzzles and activities. This section also contains a five question quiz to assess the students learning and understanding. The final section of the CD is a section designed for teachers. This section includes a printable version of the quizzes and web-based and journal based resources for teachers about health education.

Pilot Testing

After receiving approval from Washington State University's Institutional Review Board, the completed CD was distributed to five fourth to sixth grade teachers and four fourth to sixth grade students within the community. These subjects are personal contacts and not associated with any particular organization. To be included in the pilot testing, the subjects met the following inclusion criteria:

- Subjects must express interest in participating.
- Subjects must be either a fourth to sixth grade teacher or a fourth to sixth grade student.
- Subjects must sign the assent/consent forms as appropriate.
- Subjects must be able to complete the survey within a 3 week data collection period.
- Subjects must be able to communicate effectively using the English language.

The subjects were contacted by phone, mail, email or in person. The purpose of the project was explained to them, including the consent and assent forms. The subjects signed the consent and/or assent forms and completed the survey about the content and usability of the CD. The surveys are coded to a master list to maintain confidentiality and coordinate survey returns.
Validity and Reliability

By having these content experts (4th to 6th grade teachers) review the CD, the topic of face validity is addressed. The teachers will ensure that the information was accurate and appropriate for the target population. Validity is also ensured by using only scholarly and peer reviewed resources for the content. These resources include health education journals, national benchmarks and state guidelines. Reliability is addressed by pilot testing the CD with content experts and children that do not have connections to each other.

Data Management

The data collected from the surveys were managed in a confidential manner. This occurred by coding the surveys, assent and consent forms to a master list. This master list and all of the associated documents were kept in a locked cabinet and will be destroyed upon the completion of this project.

Pilot Test Results

After completion of the pilot test, the responses were complied into a master document. The responses were separated by survey question and student / teacher responses. Of the nine surveys mailed out, a total of eight surveys were returned by five teachers and three students. One student did not return the survey due to a family emergency.

The major themes that emerged from the pilot test related to content, usability and presentation and included:

- The CD is attractive to the elementary aged audience.
- The content is relevant to the age group and needs of the students.
• The CD is easy to operate and can be used as part of a health education lesson or individually by the students.

Other themes that emerged related to the credibility of the content. The teachers commented that it is hard to find elementary school based education materials that are created by a nurse and utilize references that are evidence based and peer reviewed. The teachers verbalized that the teacher references were up to date and relevant to the content of the CD and appropriate for the elementary school audience. Overall, it was thought that this CD would be a great addition to the health education curriculum. All of the students surveyed stated that they would like more technology based education and felt that the CD was a fun way to learn. All the teachers surveyed stated that the CD could easily be a part of their health education curriculum and planning because of its many options and ease of use.

Suggested improvements to the CD were related to content and visual appearance. One teacher suggested that the addition of music and animation at the beginning would draw the students in. Other teacher suggestions included the addition of a section focusing on the distinction between good and bad fats and the addition of more test questions for each section. The only student suggestion was for music and animation throughout the entire CD.

Limitations and Contributions

The major limitation of this project was the small sample size used for pilot testing because of time constraints, costs, and limited contacts with appropriate participants. Ideally, a larger sample size might give more information for revision of the
CD. The major contribution of this project is the completed CD. After revision and further testing, this CD may be useful in the elementary school classroom.

Conclusion

Motivating children to lead healthy lives while still young could have a huge impact on their future. Technology advances give educators another way to teach students in a motivational manner. Students will learn in a fun and independent way, while practicing their math, reading, comprehension, science and computer skills. By using the health education CD described in this paper as a supplement to more traditional teaching methods students will learn about nutrition and exercise.


