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Educational Software Design for Young Children with Reference to Trinidad

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Abstract: Numerous application software packages exist that attempt to teach children various educational skills. However, some of these programs tend to have short-comings. A discussion is made of some pros/cons of children's educational software programs, as well as recommendations for improvement in the design of such programs. Some comments are also made on the appropriateness of several children's software packages to the curriculum of a particular country. No specific packages would be quoted since general comments would be made that all designers can look at for improving their packages. A study using questionnaires and observation was conducted to review existing software and suggest improvements that could be made to them. The results show that many packages still need a lot of improvements before the software can be extremely beneficial to students. The results of the survey also show that although general "all-country" packages are useful, local developers in each country should attempt to write packages that explore the cultural heritage, geography and history of the individual countries and also customize certain parts of the software that are related to curriculum content. Alternatively, software that meets the needs of individual countries and syllabuses may be outsourced. This can be expensive.

Key words: Educational software, software design, children's software

INTRODUCTION

The computer is an invaluable tool in training young children (http://www.pctots.com, 2007) has indicated that "There's no replacement for baby's or toddler's discovery of the real world. Today their real world includes the computer. The computer has many wonderful attributes that make it a valuable tool for parents and teachers of young children such as its ability to deliver the highest quality sounds and images while teaching cause and effect relationships". This observation also applies to preschoolers. With this in mind and based on the stress on the importance of children's educational software (http://www.childrenssoftware.com, 2007; http://www.superkids.com/aweb/pages/reviews/multisub/kinderg/02/jsadvk/merge.shtml, 2007; http://www.microweb.com/pepsite/, 2004; http://www.pctots.com, 2007) we seek to suggest a few simple guidelines that can improve the design of educational software packages. Also, many countries use children educational software designed and implemented externally. This study also examines some shortfalls of children's software with respect to school curricula and suggestions for improvement.

How study was conducted: The study was conducted by interviewing children from two kindergarten schools, one in North and the other in South Trinidad. Approximately 10 teachers were also involved in the survey and about 50 students. Data was then compiled and summarized. Summarized responses are shown later in this study and then discussed. Approximately, 13 packages were used in the research.

Details of study: Hosein (2003) mentioned some problems with existing children's software. Some problems include teaching children wrong pronunciations for words, having reward levels that were difficult to achieve and the inclusion of distracting features. For the current research, questionnaires were distributed in order to ascertain what common problems educators experienced with some existing children's software packages. After reviewing feedback from questionnaires, the compiled data showed that most educators were having problems finding appropriate follow-up activities to reinforce what was done in the classroom. It was noted, that a more curriculum-based approach to software design was in demand, as well as a more culturally-appropriate product.

Many educators were motivated enough to sketch out subject areas and content such as Social Studies: Festivals/ cultural traditions, Mathematics: Counting and problem-solving using familiar local objects e.g. steelband, Language: Story-telling in Trinidad Creole and Standard English, Music: Calypso/ Steelband/ Chutney and so on.

Table 1: Summary results for 4 different children's software programs

	Program A	Program B	Program C	Program D
Method	Consists of educational activities that colour recognition, teach phonics, early math and other basic skills.	Learning about different countries and cultures through stories, songs, math skills, phonics along with other skills.	Program is designed to promote attention span, listening skills allow children to make predictions, based on clues.	An adventurous, fun- based set of activities which provides opportunities for enhancing early math, early language and countless other skills.
Pros	Quite an attractive package which includes songs, exciting animations and colourful sites. It can be used for two distinct age groups.	It attempts to provide a wide knowledge base about different countries and languages. Promotes a lot of general knowledge.	Fun graphics, cute characters. Very interactive (verbal interaction, prompts children to predict) Age appropriate.	Captivating graphics; Reduces or expands difficulty levels. Quite interactive with lots of motivating rewards.
Cons	The transition between levels is not smooth, as there seems to be a gap where one level is too easy and the other too challenging.	At times difficult to maneuver out of games and frustrates the preschooler because of the language barrier. Creates dependence on adults.	A bit simplistic and tends to become boring after a while. Activities could be more innovative. Sometimes too predictable/repetitive.	Too much choice available to the preschooler who becomes easily distracted. Too many distracting rewards that take attention away from skills at hand. Too many levels available in one programme.
Best For	Developing longer attention span in younger children and more formal work in older ones, due to the gap between levels.	Those looking to add variety to their software collection. Much more suited for older children involved in research projects.	Suitable for very young children, who prefer to watch and listen.	Suitable for older children who have more self control.

In a bid to gather as much information as possible, present software programs were reviewed and recurrent problems such as age appropriateness, incompletion of tasks, too many distractions, too much dependence on the teacher, accents that induce wrong pronunciations were noted (Hasein, 2003). These problems and concerns indicate a need to redesign and develop new content-appropriate and independent-based program that will allow children to manipulate with the minimum amount of assistance while gaining maximum benefits.

The overall feedback indicated that there was a need for local software. Some educators actually asked when such software will be available to the public.

Table 1 shows 4 packages, their main methods of teaching and some pros/cons.

CHILDREN/TEACHER'S VIEWS ON EXISTING PACKAGES AND SOME SUGGESTIONS FOR IMPROVEMENT

Summary questionnaire data from teachers.

Responses: Do you think the present software programs are age appropriate?

* Many are appropriate.
* To some extent- need to be more organized.
* Some programs are appropriate: Clear instructions, graded levels.
* Some of them are too cluttered with information.
* Some that cater for an age range e.g. 3-5 discourage students from the lower age level because some levels are too difficult for them.

How do current programs reinforce what it taught at school?

* Try to use software with similar activities
* Search for games with matching concepts e.g. problem solving, language etc.
* Use appropriate games with similar activities e.g. Jumpstart®
* I sometimes devise my own activities on a blank page for children.

What changes do you have to make to integrate curriculum content?

* Look for thematic approach - age appropriateness
* Try to find activities that match my theme.
* When I can't find a suitable activity I usually use drawing tools.
* Difficult to find matching activities on the present software, due to out themes.

How do you feel about working with a locally flavored software program?

* Great idea! Where can I get it?
* Fantastic idea.
* Very good.
* It will be more meaningful to our students.

What benefits do you expect from a local software program?

* Local content, age appropriate, caters to multiple intelligences.
* Developmentally appropriate, fun.
* Culture appropriate - focus on variety of cultures in our country.
* Software must support present learning in situations to which children can relate.

What sort of content do you expect a local software package to contain?

* Information about people, culture, food, heritage.
* Cover all areas of curriculum; include local music-different levels.
* Numeracy and language must use local items.
* Science: local foods, trees, animals etc.
* Social: Cultural and religious festivals, places of interest etc.
* Include local heroes, local music, should be theme based.

Miscellaneous problems:

* Some coloring areas were too small for children to access to color.
* Older children may master a program too quickly.
* Some activities are difficult to understand.
* No easy way or no way at all to bypass instructions.
* Too many ideas taught at one time.

Some of the software was not appropriate for the age group listed on the installation CD. Some levels were too difficult for the ages specified. For example, if a package is for 4-5 years old, a suggestion is to clearly separate sections for the age groups e.g. 4 year old stages, 5 year old stages. It was also, observed that a child trying a stage designed for older children was easily discouraged.

Where coloring was involved, some areas were too small for children to access to color. Developers should bear in mind that children have to use a mouse to do coloring and if the area is too small, it is easy to color out of that object area.

Many older children mastered the programs quickly and got bored. Developers should ensure that programs are age appropriate. Also, programs should be pilot tested with schools before their release, to ensure that the programs are age-relevant.

Some activities difficult for children to understand. It is suggested that simpler instructions be used in that case. Also, check age-appropriateness.

Some packages had simple instructions but there was no way to bypass instructions although instructions were simple. A simple use of "ESC" or a function key should be able to skip instructions in a better software design approach.

A few packages tried to teach too much at the same time; e.g. teaching several shapes at the same time. This led to confusion. More time should be given for kids to absorb knowledge before moving on to new ideas.

GEOGRAPHY AND HERITAGE CONTENT

Many teachers felt that the existing software did not teach children about their country. Programs tended to have foreign information. One had a calendar with "Thanksgiving Day" which is not celebrated locally. Local holidays for this country e.g. "Indian Arrival Day" could have been included. This could be easily incorporated if some customization of the software is done that allows educators to enter country specific information. With the need to safeguard proprietary code, programmers can hide their code but allow access through a special software interface for updating.

Information like the geography of the island should be included as well as the National Anthem for instance. The students should be able to click a map and interact with various locations of their countries. One program that attempted to include National Anthems of all the countries around the world is PCGLOBE®. A similar approach is needed for local software. Alternatively, a licence to use parts of other software that are relevant can be obtained. This can save development effort and money.

CONCLUSION

A study has been conducted by looking at two pre-school centres and the use of several software packages for study. The results have shown that many off-the-shelf packages are generally deficient in meeting the goal of providing a broad educational knowledge to the preschooler. For example, a country's heritage information and cultural activities tend to be absent. The solution lies in the use of customizing software to meet the needs of local educators for each country. One way of doing this is through an open-source initiative or by the employment of programmers specifically for this purpose. However, the cost of developing such software can be expensive, so there would be the need for additional funding e.g. by the Ministry of Education.

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