"StarChild" Applications in a Classroom Setting

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Abstract "StarChild" is a World Wide Web learning center for young astronomers developed by middle school teachers in conjunction with scientists at the High-Energy Astrophysics Science Archive Research Center at NASA-Goddard Space Flight Center. The site is designed to function as an instructional tool which will both educate and excite elementary and middle school students about a variety of astronomy topics.

1. Introduction

Initiated in the Summer of 1996, the "StarChild" web site for teaching astronomy is an example of a successful collaboration between educators and scientists. In the course of the site development, current factual information on each topic is gathered by middle school teachers from a variety of expert sources. This information is then translated into language both understandable and meaningful to elementary and middle school students. The active involvement of professional astronomers in site development assures continuous review of all content for scientific accuracy.

The "StarChild" site is designed to be as appealing to young learners as it is educational. In addition, a conscious effort has been made to make "StarChild" a website with international appeal. Color images, film clips, original graphics, and interactive activities are all crucial components of the site. The 145,000 accesses to the site recorded during May 1997 lead us to believe we are successfully achieving these goals.

2. Brief description of "StarChild" web site

"StarChild" explores the Universe on two different learning levels. Level 1 of the site is appropriate for use by learners whose reading or oral comprehension levels match those of students usually found in kindergarten through grade four. Level 2 is most effectively used by learners whose reading comprehension ability compares to that of students usually assigned to grades five through eight. Both levels are divided into four main sections:

- "Solar System"—This section includes topics such as "Planets," "Sun," "Moon," "Comets," "Asteroids," and "Meteoroids."
- "Universe"—Topics in this section are "Galaxies," "Milky Way," "Stars," "Black Holes," and "Quasars."
- "Space Stuff"—Included in this section are the topics "Space Travel," "Space Wardrobe," "Astronauts," "Space Probes," and "Hubble Space Telescope."

• "Glossary"—This section defines words which may be unfamiliar to the students. The text-glossary links also allow the web site to be more easily utilized by students with limited proficiency in English.

3. Using "StarChild" in the classroom

Each level of "StarChild" has its own menu of primarily interactive activities. The activities are sufficiently varied in focus to appeal to a variety of different student interests and talents. In addition, the activities are multidisciplinary and multicultural. "A Song for All Seasons," an activity in the "Solar System" section, uses Vivaldi's musical masterpiece "The Four Seasons" as the basis for determining the relationship between the Sun and the Earth during a particular season of the year. "Astro Trek," a *Hands-On Universe* activity, tests a student's word recognition ability. The activity "Astro-Logically Speaking," found in the "Space Stuff" section, tests a learner's ability to reason logically, while "Time After Time" allows the student to correlate historical events with important astronomical events.

"StarChild" can stand alone as an instructional unit on astronomy in elementary and middle schools having sufficient computers to accommodate a classroom of learners. The web site is located at http://starchild.gsfc.nasa.gov/. Because the web site is written at two instructional levels, adaptations can be made to meet the needs of students working at lower or higher levels than that of their peers. The numerous reinforcement and enrichment activities included in "StarChild" provide additional means for teachers to tailor the web site to meet individual student needs and interests. In schools where the lack of computers does not allow "StarChild" to be used simultaneously by an entire classroom of learners, the program can be made available to individuals or small groups for remediation or enrichment purposes. For those schools without an Internet connection, "StarChild" is available on a CD-ROM compatible with both IBM and Macintosh computers. "StarChild" contains a wealth of astronomy information not frequently encountered in one location, making it a rich reference source for a variety of astronomy-related topics.

4. Future developments

To reflect the ever-growing body of scientific knowledge, the "StarChild" site is constantly being revised and expanded. New activities are continuously being developed and added to Levels 1 and 2 of the "StarChild" site. A "StarChild" poster series will soon be available to educators. The first poster in the series, depicting the life cycle of a star, will be distributed starting in late 1997. With the expanding opportunities afforded today's youth through technological advances, it is important that educators not let a child lose sight of the simple pleasure that comes from stargazing or finding a meteorite. "StarChild" is provided in an effort to bridge the gap between technology and the basics in astronomy education.