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Science Review 1

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Summary:

A three-year study was conducted to investigate approaches to incorporating computer science into upper-elementary schools. With the increase of teaching computer science to high schoolers, there is a push to introduce this method of learning to the younger generation as well. Weintrop, Hansen, Harlow, and Franklin (2018) stated that a “number of national, state-level, and district-level initiatives” have been made in hopes of bringing computer science instruction into all student’s education, including those at the elementary level. In doing so, it is necessary that all materials required are “accessible, effective and developmentally appropriate” (Weintrop, Hansen, Harlow, & Franklin, 2018). With the initiative to add computer science into elementary schools, it is vital that educators learn how to appropriately teach computer science to these younger learners.

The study was designed to construct an environment and curriculum tailored to elementary classrooms; findings were then evaluated. The curriculum was taught over 15-week periods and students spent about one hour a week working on it. According to Weintrop et al. (2018), the environment, titled “LaPlaya”, used a visual, block-based design to support open-ended and guided exploration. The “KELP-CS” curriculum, was created in hopes of being a “developmentally-appropriate introduction to foundational computer science concepts” (Weintrop et al., 2018). The results of this study showed that all levels, including grades 4-6, were able to learn the curriculum successfully regardless of any prior computer science knowledge. However, the project did come with some challenges relating to concepts, curriculum and tools.

In conclusion, the project successfully showed how computer science could be incorporated into elementary schools. However, further research based in elementary schools

must still be done. Although there is much research on computer science in high school, the addition to elementary school needs more work. While this study provides challenges in bringing computer science into the elementary classroom, it can also be used to help teachers understand how to incorporate computer science in early education.

Reflection:

With the increase of technology in education and society today, it is important to begin teaching students the required skills at an early age. In the past, students were taught computer science primarily in high school to prepare them for future coursework or careers. Nevertheless, with the increasing use of technology, the goal has shifted towards “creating a computationally literate citizenry” (Weintrop et al., 2018). For this to be done, science educators, and even now elementary teachers, must understand such instructional methods and should know the benefits of incorporating computer science into their science lessons.

It is essential that computer technology not only be incorporated into subjects such as math or language arts, but also into science. The addition of computer science to elementary plans can not only prepare students for further learning in the subject but can also advance their knowledge and understanding of the basic concepts and computer skills. Along with the basic topics covered in science, including biology, chemistry, astronomy, and many others, computer science should be included in early learning. If teachers are uneducated in the area, there are several online resources regarding computer science activities and instructional methods used to teach the subject. Online activities also allow teachers to choose the grade-level so that students are learning the age-appropriate material.

Educators can begin teaching students about computer science by explaining what it is and how it can be used. Teachers can then introduce students to beginner activities through their time in the library or the computer lab on a weekly basis. Once students are familiar with the basic concepts of computer science, teachers can use the program to incorporate other science material. For example, if students are learning about the water cycle, they may have an activity coinciding with this subject matter which could be completed through the computer program. The use of such activities can not only advance their knowledge of subject content but can increase student creativity and improve visual learning, while enhancing computer skills. Overall, educators who are teaching science should not disregard the use of computer science in their teaching and should learn how to bring computer science into their classrooms.

Organization:

The American Association for the Advancement of Science, or AAAS, is a non-profit organization that works to “advance science, engineering, and innovation throughout the world for the benefit of all people” (AAAS, 2020). The organization supports individuals in the science world including scientists, engineers, advocates and teachers. Members of this organization can enjoy the benefits of shared research, resources, unlimited access to science news and more. Along with these resources, AAAS also publishes peer-reviewed journals including, *Science*, *Science Signaling*, *Science Translational Medicine*, *Science Advances*, *Science Immunology*, and *Science Robotics*, which can be used by teachers through incorporation into their science lessons. These journals can be extremely beneficial to teachers and students in the field of science for current research and findings in the scientific world. The organization has programs which advocate for science education along with providing a resource center available to teachers.

Teachers can explore resources centered around learning and teaching in science, science in the classroom, curriculum focus, and much more. One of their programs called “Science in the Classroom” (SitC) includes educator guides which suggest specific activities, questions and resources in exploring science further. The program also provides teachers with new research to include in their instruction and ways to incorporate those findings into their lessons.

References

American Association for the Advancement of Science. (2020). Retrieved from

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