Good Reading from Other Sources on Astronomy Education and Outreach (Published in 2010)

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Abstract

We present our sixth annotated listing of readings about astronomy education and outreach that appeared during the previous calendar year in publications other than Astronomy Education Review. To keep things manageable, we only cover readings directly related to astronomy (even though there are many articles about physics, geology, or chemistry education that could easily be applied to astronomy classrooms.) Only contributions that are in published journals and magazines (as opposed to newsletters or web bulletins) are listed. Suggestions for additions to the list are most welcome.

1. Papers and Articles on K-12 Astronomy Education

Barrier, R. 2010, “Astronomical Misconceptions,” Physics Teacher, 48, 319. Pre-tests and post-tests on astronomical topics were given to 98 teachers who took 10-hour workshops on astronomical topics. Understanding improved, but many misconceptions remained. (May 2010)


Hannust, T. and Kikas, E. “Young Children’s Acquisition of Knowledge about the Earth: A Longitudinal Study,” Journal of Experimental Child Psychology, 107(2), 164. Followed 143 children ages 2–3 for 3 years to see how their mental model of the Earth developed and could be challenged. (Oct. 2010)

Hobson, S. et al. 2010, “Using a Planetarium Software Program to Promote Conceptual Change with Young Children,” Journal of Science Education and Technology, 19(2), 165. 21 children ages 7–9 were interviewed before and after using Starry Night software and inquiry based activities to learn concepts related to the appearance of the Moon in the sky. Conceptual understanding increased despite how abstract the concepts were for that age group. (Apr. 2010)

Lee, V. 2010, “How Different Variants of Orbit Diagrams Influence Student Explanations of the Seasons,” Science Education, 94, 985. Used 652 written surveys of 9th grade students to determine whether illustrations depicting Earth’s orbit as highly elliptical contribute to misconceptions about the seasons. Despite earlier suggestions, elongation of the orbit was not found to have an effect, though other features of diagrams may.


Price, A. and Lee, H. 2010, “The Effect of Two-Dimensional and Stereoscopic Presentation on Middle School Students’ Performance on Spatial Cognition Tasks,” *Journal of Science Education and Technology*, 19(1), 90. Flat and stereo representations of the same concepts were tried on 19 middle-school students visiting a planetarium. Their accuracy was the same, but things took longer with those working with stereo. (Feb. 2010)

Shen, J. and Confrey, J. 2010, “Justifying Alternative Models in Learning Astronomy: A Study of K-8 Science Teachers’ Understanding of Frames of Reference,” *International Journal of Science Education*, 32, 1. Most of 14 teachers believed that the geocentric model should not be used in instruction. Their long-held beliefs, lack of observational experience, and resistance in switching between two models made it difficult for them to have a deep understanding of the relationship of the two models.


Sun, K., Lin, C. and Wang, W. 2010, “A 3D Virtual-Reality Model of the Sun and the Moon for E-learning at Elementary Schools,” *International Journal of Science and Mathematics Education*, 8, 689. Four classes of Taiwanese 4th graders (N=128) were split, and one group received instruction using a virtual reality model. Pre/post test results and an attitudinal survey favored the use of the VR based instruction over the traditional.


2. Papers and Articles on College Astronomy Education

Fons, J. 2010, “A Year without Paper: Tablet Computers in the Classroom,” *Physics Teacher*, 48, 481. Although not exactly about astronomy, this article may show a glimpse of our future. A general physics class was conducted entirely using a Windows tablet, on which students could write and make diagrams using an electronic stylus.


Krisciunas, K. 2010, “Determining the Eccentricity of the Moon’s Orbit without a Telescope,” *American Journal of Physics*, 78(8), 834. An advanced activity, using a piece of cardboard with a small hole in it, which
slides up and down a yardstick, to show that it is possible to determine the eccentricity of the Moon’s orbit. (Aug. 2010)


3. Papers or Articles on Astronomy Outreach


Cappelli, V. and Di Benedetto, C. 2010, “Celestial Themed Cartoons Captivate Children,” *Communicating Astronomy with the Public Journal*, issue 10, 22. Describes collaboration between a research institute and Disney in Italy, creating a kit distributed to 30,000 children. Completely “show-and-tell” with no evaluation, but interesting ideas. (Dec. 2010)

Carbon, C. 2010, “The Earth is Flat when Personally Significant Experiences with the Sphericity of the Earth are Absent,” *Cognition*, 16(1), 130. People were asked to estimate the distance to six cities on different continents and were interviewed. Those who had some personal experience with a round Earth did better in estimating distances, while those that didn’t seem to make estimates compatible with the notion of a flat Earth.


Keel, W. 2010, “Welcome to the Galaxy Zoo,” Astronomy, 38(9), 30. Describes a citizen science program in which volunteers classify galaxies – and, now, other astronomical phenomena. (Sep. 2010)


Morrison, D. 2010, “The Storms Over Climate Change,” Skeptical Inquirer, 34(6), 54. Planetary scientists David Morrison reviews three key books about the understanding-of-science issues related to climate change and some of the political reasons why there is a controversy. (Nov/Dec. 2010)


4. Books on Astronomy Education and Outreach

Asbell-Clark, J. et al. 2010, Investigating Astronomy. Armonk, New York: It’s About Time Publishing. While we don’t regularly include astronomy textbooks in this listing, this volume is sufficiently different to merit special consideration. It is a manual for a high-school course in astronomy built up from hands-on activities, investigations, group work, etc. It’s an attempt to put into practice the results of the kinds of astronomy education research that is chronicled in the pages of Astronomy Education Review.

Bailey, J., Slater, S. and Slater, T. 2011, Conducting Astronomy Education Research: A Primer. New York, NY: W. H. Freeman. This concise volume is a superb introduction to the ideas and practice of research design, interpretation, and publishing. Should be on the desk of everyone thinking of writing a paper for this journal. Although the copyright date is 2011, it was published and distributed in 2010.

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