



Network for Information and Digital Access

---

## **The impact of Science Literacy delivery methods - what works?**

### Bibliography

**Graphics** | Group 3. Traditional publishing and journalism  
- print and broadcast

Ver. 1.00

Date: November 2018

## Introduction

This thematic bibliography is the result of research to survey existing literature available on Science Literacy delivery methods.

The search was carried out by retrieving documents and articles from a wide range of sources, including research databases, Google Scholar, ResearchGate, subject databases, open access repositories etc. using keyword combinations.

The results of the resource discovery are divided into two groups: one containing impact assessments using qualitative, quantitative or mixed method (both qualitative and quantitative) approaches to data collection and a second including descriptive resources, which encompass, for example, reviews, guides, handbooks, reports and project reports.

This bibliography is work in progress and is not designed to be fully exhaustive or complete. We will be pleased to receive suggestions and recommendations for additions that can contribute to the understanding of science, its applications and, to the promotion of science literacy.

## Groups and methods list

During the first part of the Desk Research phase of this project (i.e. Task 1), the team identified 42 single-mechanism approaches, 2 composite approaches and 1 related approach that were relevant to the delivery and dissemination of scientific information. The list of single mechanisms was further organised into 7 thematic groups, as presented in the following Table.

Single mechanism approach	Group
Exhibitions, Expo, Festivals, Movies, Picnics, Science fairs, Seminars, Talks, TED Talks, Theatre, Workshops	1. Events, meetings, performances
Colloquia, Courses, Curricula, E-learning, Webinars	2. Education and training – including online
Animations, Books, Brochures, Cartoons, Comics, Games, Graphics, Posters, Publications, Radio, Reports, TV, Videos	3. Traditional publishing and journalism – print and broadcast
Competitions, Experiments, Makerspaces, Mobile classrooms, Mobile laboratories	4. Activities and services
Blogs, E-books, E-zines, Mobile Apps, Podcasts, Social media, Websites, Wikis	5. Online interactions
<b>Composite approaches</b>	
Multiliteracies	
Multimodalities	
<b>Related approach</b>	
Citizen Science	

Attribution 4.0 International (CC BY 4.0)

## Impact Assessment

- Bergerud, Donna, Thomas C. Lovitt, and Steven Horton. "The Effectiveness of Textbook Adaptations in Life Science for High School Students with Learning Disabilities." *Journal of Learning Disabilities* 21, no. 2 (February 1988): 70–76. <https://doi.org/10.1177/002221948802100202>.
- Condidorio, Kristina. "The Usefulness of Graphic Organizers in Enhancing Science Learning," 2010.
- Dexter, Douglas D., and Charles A. Hughes. "Graphic Organizers and Students with Learning Disabilities: A Meta-Analysis." *Learning Disability Quarterly* 34, no. 1 (February 2011): 51–72. <https://doi.org/10.1177/073194871103400104>.
- Dexter, Douglas D., Youn J. Park, and Charles A. Hughes. "A Meta-Analytic Review of Graphic Organizers and Science Instruction for Adolescents with Learning Disabilities: Implications for the Intermediate and Secondary Science Classroom." *Learning Disabilities Research & Practice* 26, no. 4 (November 2011): 204–13. <https://doi.org/10.1111/j.1540-5826.2011.00341.x>.
- Evans, Abigail T., Ellen Peters, Andrew A. Strasser, Lydia F. Emery, Kaitlin M. Sheerin, and Daniel Romer. "Graphic Warning Labels Elicit Affective and Thoughtful Responses from Smokers: Results of a Randomized Clinical Trial." Edited by Keitaro Matsuo. *PLOS ONE* 10, no. 12 (December 16, 2015): e0142879. <https://doi.org/10.1371/journal.pone.0142879>.
- Gebre, Engida. "Learning with Multiple Representations: Infographics as Cognitive Tools for Authentic Learning in Science Literacy | Apprendre Avec Des Représentations Multiples: L'infographie de Presse Comme Outil Cognitif Pour l'apprentissage Authentique En Science." *Canadian Journal of Learning and Technology / La Revue Canadienne de l'apprentissage et de La Technologie* 44, no. 1 (May 8, 2018). <https://doi.org/10.21432/cjlt27572>.
- Kambouri, Maria. "Science Learning and Graphic Symbols: An Exploration of Early Years Teachers' Views And Use of Graphic Symbols When Teaching Science." *EURASIA Journal of Mathematics, Science & Technology Education* 12, no. 10 (October 15, 2016). <https://doi.org/10.12973/eurasia.2016.1275a>.
- Kees, Jeremy, Scot Burton, J. Craig Andrews, and John Kozup. "Understanding How Graphic Pictorial Warnings Work on Cigarette Packaging." *Journal of Public Policy & Marketing* 29, no. 2 (November 2010): 265–76. <https://doi.org/10.1509/jppm.29.2.265>.
- Ma, Xiaojuan. "Developing Design Guidelines for a Visual Vocabulary of Electronic Medical Information to Improve Health Literacy." *Interacting with Computers*, July 24, 2015, iwv025. <https://doi.org/10.1093/iwc/iwv025>.
- McCaffery, Kirsten J., Ann Dixon, Andrew Hayen, Jesse Jansen, Sian Smith, and Judy M. Simpson. "The Influence of Graphic Display Format on the Interpretations of Quantitative Risk Information among Adults with Lower Education and Literacy: A Randomized Experimental Study." *Medical Decision Making* 32, no. 4 (July 2012): 532–44. <https://doi.org/10.1177/0272989X11424926>.
- Mullen, Karina C. "Graphic Recording: Using Vivid Visuals to Communicate Climate Change." *The Electronic Journal of Communication / La Revue Electronique de Communication* 23, no. 3 (2103). <http://www.cios.org/www.cios.org/EJCPUBLIC/023/3/023034.html>.
- Rau, Martina A., Joseph E. Michaelis, and Natalie Fay. "Connection Making between Multiple Graphical Representations: A Multi-Methods Approach for Domain-Specific Grounding of an Intelligent Tutoring System for Chemistry." *Computers & Education* 82 (March 2015): 460–85. <https://doi.org/10.1016/j.compedu.2014.12.009>.
- Schapira, Marilyn M., Ann B. Nattinger, and Timothy L. McAuliffe. "The Influence of Graphic Format on Breast Cancer Risk Communication." *Journal of Health Communication* 11, no. 6 (July 2006): 569–82. <https://doi.org/10.1080/10810730600829916>.

- Torres, Milano, Rebecca Nueva Espana, and Antriman Orleans. "Integrating Graphic Organizers in Facilitating Learning Chemistry." *International Journal of Educational Studies* 1 (January 1, 2014): 1–8. [https://www.researchgate.net/publication/277982164\\_Integrating\\_graphic\\_organizers\\_in\\_facilitating\\_learning\\_chemistry](https://www.researchgate.net/publication/277982164_Integrating_graphic_organizers_in_facilitating_learning_chemistry).
- Viswanathan, Madhubalan, Manoj Hastak, and Roland Gau. "Understanding and Facilitating the Usage of Nutritional Labels by Low-Literate Consumers." *Journal of Public Policy & Marketing* 28, no. 2 (November 2009): 135–45. <https://doi.org/10.1509/jppm.28.2.135>.
- Wiley, Jennifer, David Sarmiento, Thomas D. Griffin, and Scott R. Hinze. "Biology Textbook Graphics and Their Impact on Expectations of Understanding." *Discourse Processes* 54, no. 5–6 (July 4, 2017): 463–78. <https://doi.org/10.1080/0163853X.2017.1319655>.

## Descriptive Resources

- Bucchi, Massimiano, and Barbara Saracino. "'Visual Science Literacy': Images and Public Understanding of Science in the Digital Age." *Science Communication* 38, no. 6 (December 2016): 812–19. <https://doi.org/10.1177/1075547016677833>.
- Capstone Publishing. "Using Graphic Organizers in Literature-Based Science Instruction." Capstone. Accessed August 13, 2018. [http://www.capstonepub.com/classroom/sites/PDFs/graphic-science/Graphic\\_Science\\_TG\\_Sampler.pdf](http://www.capstonepub.com/classroom/sites/PDFs/graphic-science/Graphic_Science_TG_Sampler.pdf).
- Coleman, Julianne M., and John A. Dantzler. "The Frequency and Type of Graphical Representations in Science Trade Books for Children." *Journal of Visual Literacy* 35, no. 1 (January 2, 2016): 24–41. <https://doi.org/10.1080/1051144X.2016.1198543>.
- Coleman, Julianne M., Erin M. McTigue, and Laura B. Smolkin. "Elementary Teachers' Use of Graphical Representations in Science Teaching." *Journal of Science Teacher Education* 22, no. 7 (October 2011): 613–43. <https://doi.org/10.1007/s10972-010-9204-1>.
- Cox, Carole. "Using Graphic Organizers in Literature-Based Science Instruction | Reading Rockets." Reading Rockets. Accessed August 13, 2018. <http://www.readingrockets.org/article/using-graphic-organizers-literature-based-science-instruction>.
- Gerber, Rod, Gillian Boulton-Lewis, and Christine Bruce. "Children's Understanding of Graphical Representations of Quantitative Data." *Learning and Instruction* 5, no. 1 (January 1995): 77–100. [https://doi.org/10.1016/0959-4752\(95\)00001-J](https://doi.org/10.1016/0959-4752(95)00001-J).
- Hamad, Elhassan, and Sarah Elheir. "Assessment of Scientific Graphical Literacy of 10th Grade Students in Al-Ain Educational Office, United Arab Emirates." Master's thesis, United Arab Emirates University (UAEU), 2015. [https://scholarworks.uaeu.ac.ae/all\\_theses/204](https://scholarworks.uaeu.ac.ae/all_theses/204).
- J. Anglin, Gary, and Hossein Vaez. "Visual Representations and Learning: The Role of Static and Animated Graphics." In *Handbook of Research for Educational Communications and Technology*, 2nd ed., 865–916. Mahwah, NJ,: Lawrence Erlbaum Associates, 2004. <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.518.6233>.
- Khine, Myint, and Liu Yang. "Descriptive Analysis of the Graphic Representations of Science Textbooks." *European Journal of STEM Education* 2, no. 3 (December 28, 2017). <https://doi.org/10.20897/ejsteme/81285>.
- McTigue, Erin M., and Amanda C. Flowers. "Science Visual Literacy: Learners' Perceptions and Knowledge of Diagrams." *The Reading Teacher* 64, no. 8 (May 2011): 578–89. <https://doi.org/10.1598/RT.64.8.3>.

- Noe, Matthew N. "Graphic Medicine Book Title List," 2017. [http://wisconsinliteracyorg.presencehost.net/file\\_download/bd343149-0a60-4764-85d1-0b2c0d098e69](http://wisconsinliteracyorg.presencehost.net/file_download/bd343149-0a60-4764-85d1-0b2c0d098e69).
- Nuccitelli, Dana. "In Pictures: Cutting Edge Climate Science, Communication, and Kittens from the 2013 AGU Conference | Dana Nuccitelli." *The Guardian*, December 17, 2013, sec. Environment. <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2013/dec/17/climate-change-agu2013-pictures>.
- Robinson, Daniel H. "Graphic Organizers as Aids to Text Learning." *Reading Research and Instruction* 37, no. 2 (December 1997): 85–105. <https://doi.org/10.1080/19388079809558257>.
- Sharma, Sashi. "Assessing Students' Understanding of Tables and Graphs: Implications for Teaching and Research." *International Journal of Educational Research and Technology* 4, no. 4 (December 2013): 51–70. <http://soeagra.com/ijert/ijertdecember2013/10f.pdf>.
- Teachnology Publishing Company. *Teacher Workbooks. Graphic Organizer Series Science Organizers*. Vol. 1. Teachnology Publishing Company, A Division of Teachnology, Inc., 2003. <https://docplayer.net/20891216-Teacher-workbooks-graphic-organizer-series-science-organizers-vol-1-copyright-2003-teachnology-publishing-company-a-division-of-teachnology-inc.html>.
- Wilmot, Robin M., Deborah L. Begoray, and Elizabeth M. Banister. "Aboriginal Adolescents, Critical Media Health Literacy, and the Creation of a Graphic Novel Health Education Tool." *In Education* 19, no. 2 (2013): 72–85. <https://ineducation.ca/ineducation/article/view/143>.