

Appendix 1

Articles from the journal *Science & Education* (Springer) evaluated in this study

- Abd-El-Khalick, F. (2013). Teaching *with* and *about* nature of science, and science teacher knowledge domains. *Science & Education*, 22(9), 2087–2107.
- Allchin, D. (1999). Values in science: An educational perspective. *Science & Education*, 8(1), 1–12.
- Allchin, D. (2004). Pseudohistory and pseudoscience. *Science & Education*, 13(3), 179–195.
- Allgaier, J. (2010). Scientific experts and the controversy about teaching creation/evolution in the UK press. *Science & Education*, 19(6-8), 797–819.
- Blake, D.D. (1994). Revolution, revision or reversal: Genetics-ethics curriculum. *Science & Education*, 3(4), 373–391.
- Blanco, M.P. (2014). “Palabras de la ciencia”: Pedro Castera and scientific writing in Mexico’s *fin de siècle*. *Science & Education*, 23(3), 541–556.
- Carolino, L.M. (2012). Measuring the heavens to rule the territory: Felipe Folque and the teaching of astronomy at the Lisbon Polytechnic school and the modernization of the state apparatus in nineteenth century Portugal. *Science & Education*, 21(1), 109–133.
- Carrier, M. (2013). Values and objectivity in science: Value-ladenness, pluralism and the epistemic attitude. *Science & Education*, 22(10), 2547–2568.
- Cartwright, J. (2007). Science and literature: Towards a conceptual framework. *Science & Education*, 16(2), 115–139.
- Chamizo, J.A. (2013). A new definition of models and modeling in chemistry’s teaching. *Science & Education*, 22(7), 1613–1632.
- Coburn, W.W. (1995). Science education as an exercise in foreign affairs. *Science & Education*, 4(3), 287–302.
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- Cordero, A. (1992). Science, objectivity and moral values. *Science & Education*, 1(1), 49–70.
- Cordero, A. (2012). Mario Bunge’s scientific realism. *Science & Education*, 21(10), 1419–1436.
- Crasnow, S. (2008). Feminist philosophy of science: “Standpoint” and knowledge. *Science & Education*, 17(10), 1089–1110.
- Cushing, J.T. (1995). Hermeneutics, underdetermination and quantum mechanics. *Science & Education*, 4(2), 137–147.

- Dahlin, B. (2001). The primacy of cognition — or of perception? A phenomenological critique of the theoretical bases of science education. *Science & Education*, 10(5), 453–475.
- Davson-Galle, P. (2002). Science, values and objectivity. *Science & Education*, 11(2), 191–202.
- Deng, F., Chai, C.S., Tsai, C.-C., & Lin, T.-J. (2014). Assessing South China (Guangzhou) high school students' views on nature of science: A validation study. *Science & Education*, 23(4), 843–863.
- Depew, D.J. (2010). Darwinian controversies: An historiographical recounting. *Science & Education*, 19(4–5), 323–366.
- Develaki, M. (2007). The model-based view of scientific theories and the structuring of school science programmes. *Science & Education*, 16(7–8), 725–749.
- Develaki, M. (2008). Social and ethical dimension of the natural sciences, complex problems of the age, interdisciplinarity, and the contribution of education. *Science & Education*, 17(8–9), 873–888.
- Develaki, M. (2012). Integrating scientific methods and knowledge into the teaching of Newton's theory of gravitation: An instructional sequence for teachers' and students' nature of science education. *Science & Education*, 21(6), 853–879.
- Eger, M. (1993). Hermeneutics as an approach to science: Part II. *Science & Education*, 2(4), 303–328.
- El-Hani, C.N. (2015). Mendel in genetics teaching: Some contributions from history of science and articles for teachers. *Science & Education*, 24(1–2), 173–204.
- Erduran, S., & Mugaloglu, E.Z. (2013). Interactions of economics of science and science education: Investigating the implications for science teaching and learning. *Science & Education*, 22(10), 2405–2425.
- Ernest, P. (1992). The nature of mathematics: Towards a social constructivist account. *Science & Education*, 1(1), 89–100.
- Fiss, A. (2012). Problems of abstraction: Defining an American standard for mathematics education at the turn of the twentieth century. *Science & Education*, 21(8), 1185–1197.
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- Galili, I. (2011). Promotion of cultural content knowledge through the use of the history and philosophy of science. *Science & Education*, 21(9), 1283–1316.
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- Garrison, J. (2000). A reply to Davson-Galle. *Science & Education*, 9(6), 615–620.
- Gauch, H.G. (2009). Science, worldviews and education. *Science & Education*, 18(6–7), 667–695.
- Gauld, C.F. (2005). Habits of mind, scholarship and decision making in science and religion. *Science & Education*, 14(3–5), 291–308.
- Gil-Pérez, D., Vilches, A., Fernández, I., Cachapuz, A., Praia, J., Valdés, P., Salinas, J. (2005). Technology as 'applied science': A serious misconception that reinforces distorted and impoverished views of science. *Science & Education*, 14(3–5), 309–320.
- Ginev, D.J. (2008). Hermeneutics of science and multi-gendered science education. *Science & Education*, 17(10), 1139–1156.
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- Hadzidaki, P. (2008a). 'Quantum mechanics' and 'scientific explanation' an explanatory strategy aiming at providing 'understanding.' *Science & Education*, 17(1), 49–73.
- Heffron, J.M. (1995). The knowledge most worth having: Otis W. Caldwell (1869–1947) and the rise of the general science course. *Science & Education*, 4(3), 227–252.
- Hildebrand, D., Bilica, K., & Capps, J. (2008). Addressing controversies in science education: A pragmatic approach to evolution education. *Science & Education*, 17(8–9), 1033–1052.
- Homchick, J. (2010). Objects and objectivity: The evolution controversy at the American museum of natural history, 1915–1928. *Science & Education*, 19(4–5), 485–503.

- Howard, D. (2009). Better red than dead — Putting an end to the social irrelevance of postwar philosophy of science. *Science & Education*, 18(2), 199–220.
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- Irzik, G., & Nola, R. (2011). A family resemblance approach to the nature of science for science education. *Science & Education*, 20(7–8), 591–607.
- Jiménez-Aleixandre, M.P. (2014). Determinism and underdetermination in genetics: Implications for students' engagement in argumentation and epistemic practices. *Science & Education*, 23(2), 465–484.
- Kipnis, N. (2007). Discovery in science and teaching science. *Science & Education*, 16(9–10), 883–920.
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- Krogh, L.B., & Nielsen, K. (2013). Introduction: How science works — and how to teach it. *Science & Education*, 22(9), 2055–2065.
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- Legates, D.R., Soon, W., Briggs, W.M., Monckton of Brenchley, C. (2015). Climate consensus and 'misinformation': A rejoinder to *Agnology, scientific consensus, and the teaching and learning of climate change*. *Science & Education*, in press.
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- Machamer, P., & Woody, A. (1994). A model of intelligibility in science: Using Galileo's balance as a model for understanding the motion of bodies. *Science & Education*, 3(3), 215–244.
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- Pospiech, G. (2003). Philosophy and quantum mechanics in science teaching. *Science & Education*, 12(5–6), 559–571.
- Quílez, J. (2009). From chemical forces to chemical rates: A historical/philosophical foundation for the teaching of chemical equilibrium. *Science & Education*, 18(9), 1203–1251.

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- Russanen, A.-M., Pöyhönen, S. (2013). Concepts in change. *Science & Education*, 22(6), 1389–1403.
- Sievers, K.H. (1999). Toward a direct realist account of observation. *Science & Education*, 8(4), 387–393.
- Skordoulis, C.D. (2008). Science and worldviews in the Marxist tradition. *Science & Education*, 17(6), 559–571.
- Silverman, M.P. (1992). Raising questions: Philosophical significance of controversy in science. *Science & Education*, 1(2), 163–179.
- Slezak, P. (1994). Sociology of scientific knowledge and scientific education, Part I. *Science & Education*, 3(3), 265–294.
- Smith, M.U., Siegel, H., & McInerney, J.D. (1995). Foundational issues in evolution education. *Science & Education*, 4(1), 23–46.
- Suchting, W.A. (1992). Constructivism deconstructed. *Science & Education*, 1(3), 223–254.
- Takacs, P., & Ruse, M. (2013). The current status of the philosophy of biology. *Science & Education*, 22(1), 5–48.
- Talanquer, V. (2013). School chemistry: The need for transgression. *Science & Education*, 22(7), 1757–1773.
- Uebel, T.E. (2004). Education, enlightenment and positivism: The Vienna Circle's scientific world-conception revisited. *Science & Education*, 13(1–2), 41–66.
- Vermeir, K. (2013). Scientific research: Commodities or commons? *Science & Education*, 22(10), 2485–2510.
- Wan, Z.H., Wong, S.L., & Zhan, Y. (2013). When nature of science meets Marxism: Aspects of nature of science taught by Chinese science teacher educators to prospective science teachers. *Science & Education*, 22(5), 1115–1140.
- Wong, S.L., Kwan, J., Hodson, D., & Jung, B.H.W. (2009). Turning crisis into opportunity: Nature of science and scientific inquiry as illustrated in the scientific research on severe acute respiratory syndrome. *Science & Education*, 18(1), 95–118.

Appendix 2

Distribution of articles (*Science & Education*) according to author's area of research, context of the study and level (classification)

No.	Authors in the reference	Author's area of research	Context of the study	Level
1	Abd-El-Khalick, F. (2013)	Science education	Nature of science and teacher knowledge	IV
2	Allchin, D. (1999)	Philosophy of science	Values in science	III
3	Allchin, D. (2004)	Philosophy of science	Craniology & phrenology as pseudoscience	III
4	Allgaier, J. (2010)	Sociology of science	Creation-evolution controversy	III
5	Blake, D.D. (1994)	Biology education	Science & ethics in genetics education	III
6	Blanco, M.P. (2014)	Literature	Science fiction	II
7	Carolino, L.M. (2012)	History of science	Teaching astronomy	II
8	Carrier, M. (2013)	Philosophy of science	Values, pluralism and objectivity	V
9	Cartwright, J. (2007)	Biology education	Literature and science	II
10	Chamizo, J.A. (2013)	Chemistry education	Models in chemistry teaching	II
11	Cobern, W.W. (1995)	Science education	Social/cultural milieu	III
12	Cobern, W.W., & Loving, C.C. (2008)	Science education	Epistemological realism	III
13	Cordero, A. (1992)	Philosophy of science	Philosophy of science	III
14	Cordero, A. (2012)	Philosophy of science	Bunge's scientific realism	III

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No.	Authors in the reference	Author's area of research	Context of the study	Level
15	Crasnow, S. (2008)	Philosophy of science	Feminist philosophy of science	III
16	Cushing, J.T. (1995)	Philosophy of physics	Contingency and quantum mechanics	III
17	Dahlin, B. (2001)	Science education	Phenomenology and science education	II
18	Davson-Galle, P. (2002)	Science education	Values and objectivity	II
19	Deng, F., Chai, C.S., Tsai, C.-C., & Lin, T.-J. (2014)	Science education	NOS views of Chinese students	II
20	Depew, D.J. (2010)	Philosophy of science	Darwinian controversies	III
21	Develaki, M. (2007)	Science education	Model-based view of scientific theories	II
22	Develaki, M. (2008)	Science education	Social & ethical dimensions of science	III
23	Develaki, M. (2012)	Science education	Newton's theory of gravitation	III
24	Eger, M. (1993)	Physics	Hermeneutics	II
25	El-Hani, C.N. (2015)	Biology education	Mendel in genetics teaching	II
26	Erduran, S., & Mugaloglu, E.Z. (2013)	Chemistry education	Economics of science & science education	II
27	Ernest, P. (1992)	Mathematics education	Social constructivism & mathematics	II
28	Fiss, A. (2012)	Science studies	Mathematics education & history of science	III
29	Ford, M. (2008)	Science education	Understanding NOS	III
30	Freire, O. (2003)	History of physics	Controversy in quantum physics	II
31	Galili, I. (2011)	Physics education	Cultural context of knowledge	IV
32	Galili, I. (2013)	Physics education	Imagery in science education	II
33	Garrison, J. (1997)	Educational philosophy	Deweyan social constructivism	II
34	Garrison, J. (2000)	Educational philosophy	Constructivism	II
35	Gauch, H.G. (2009)	Philosophy of science	Science & worldviews	III
36	Gauld, C.F. (2005)	Education	Science & religion	II
37	Gil-Pérez, D., Vilches, A., Fernández, I., Cachapuz, A., Praia, J., Valdés, P., & Salinas, J. (2005)	Science education	Science-technology relationship	III

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No.	Authors in the reference	Author's area of research	Context of the study	Level
38	Ginev, D. J. (1995)	Philosophy	Hermeneutic conception of science	II
39	Ginev, D.J. (2008)	Philosophy	Multi-gendered science	III
40	Glaserfeld, E.V. (1992)	Psychology	Constructivism	II
41	Good, R., & Shymansky, J. (2001)	Science education	Science literacy: relativist or realist	II
42	Goodney, D.E., & Long, C.S. (2003)	Chemistry	Scientific literacy based on historical texts	III
43	Grandy, R., & Duschl, R. A. (2007)	Philosophy of science	Inquiry in school science	III
44	Hadzidaki, P. (2008a)	Science education	Understanding quantum mechanics	III
45	Hadzidaki, P. (2008b)	Science education	Heisenberg microscope & NOS	III
46	Hadzigeorgiou, Y. (2015)	Science	Science education as socio-political action	II
47	Hadzigeorgiou, Y., & Schulz, R. M. (2014)	Science education	Romanticism and science education	III
48	Heelan, P.A. (1995)	Philosophy	Quantum mechanics and hermeneutics	II
49	Heffron, J.M. (1995)	History of education	General science courses & science education	III
50	Hildebrand, D., Bilica, K., & Capps, J. (2008)	Philosophy	Controversy in science education	III
51	Hoffman, M. (2013)	Science education	General science courses	II
52	Homchick, J. (2010)	Writing & rhetoric	Evolutionary theory	V
53	Howard, D. (2009)	Philosophy	Social nature of scientific knowledge	III
54	Intemann, K. (2008)	History & philosophy	Feminist values & under determination	III
55	Irzik, G. (2013)	Philosophy of science	Commercialization of science	II
56	Irzik, G., & Nola, R. (2011)	Philosophy of science	Family resemblance & nature of science	III
57	Jiang, F., & McComas, W.F. (2014)	Science education	Nature of science in popular science books	III
58	Jiménez-Aleixandre, M.P. (2014)	Biology education	Argumentation in genetics	IV
59	Jorgensen, L.M., & Ryan, S.A. (2004)	Science education	Relativism, values & morals	II

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No.	Authors in the reference	Author's area of research	Context of the study	Level
60	Jung, W. (2012)	Physics education	Philosophy of science & education	II
61	Kendig, C. (2013)	Philosophy	Integrating history & philosophy of science	II
62	Kipnis, N. (2007)	History of science	Discovery in science	II
63	Kirschner, P.A. (1992)	Science education	Practical work in science	III
64	Kitchener, R.F. (1993)	Philosophy of science	Piaget's epistemic subject	II
65	Kolstø, S.D. (2008)	Physics education	Science education & democratic citizenship	II
66	Kosso, P. (2009)	Philosophy	Scientific method	I
67	Krogh, L.B., & Nielsen, K. (2013)	Science education	Functional scientific literacy	III
68	Kruckeberg, R. (2006)	Science education	Constructivism & Dewey	I
69	Kubli, F. (2007)	Physics education	Experiments and stories in science	III
70	Lacey, H. (2009)	Philosophy of science	World views & values	II
71	Lau, K.-C., & Chan, S.-L. (2013)	Science education	Teaching theory-laden observation	IV
72	Lawson, A.E. (2000)	Biology education	Nature of knowledge	II
73	Legates, D.R., Soon, W., Briggs, W.M., Monckton of Brenchley, C. (2015)	Geography	Consensus & climate change	III
74	Leite, L. (2002)	Science education	History of science & textbooks	III
75	Levinson, R. (2008)	Science education	Socio-scientific issues	III
76	Levrini, O., Bertozzi, E., Gagliardi, M., Tomasini, N.G., Pecovi, B., Tasquier, G., & Galili, I. (2014)	Physics education	Discipline-culture framework	II
77	Lindahl, M.G. (2009)	Science education	Ethics & morals	II
78	Lindahl, M.G. (2010)	Science education	Expert knowledge	II
79	Lövheim, D. (2014)	Education	Enrollment practice	II
80	Lyons, S.L. (2010)	History of science	Evolution & education	III
81	Machamer, P., & Woody, A. (1994)	Philosophy of science	Model of intelligibility	III
82	Marroum, R.-M. (2004)	Physics education	Insight in science education	II
83	Matthews, M.R. (1992)	Science education	History & objectivity	IV

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No.	Authors in the reference	Author's area of research	Context of the study	Level
84	Matthews, M.R. (2004)	Science education	Reappraising positivism	II
85	McComas, W.F. (2008)	Biology education	Historical examples & nature of science	II
86	Metz, D., Klassen, S., McMillan, B., & Clough, M. (2007)	Science education	Historical narratives	III
87	Mugaloglu, E.Z. (2014)	Science education	Pseudo-science & constructivism	II
88	Niaz, M. (2009)	Science education	Nature of science based on historical controversies	III
89	Nielsen, K.H. (2013)	Science studies	Science in the making	III
90	Oliveira, M.B. (2013)	Science & technology	Commodification of science	II
91	Park, H., Nielsen, W., & Woodruff, E. (2014)	Science education	Nature of science	III
92	Patronis, T., & Spanos, D. (2013)	Mathematics education	Hermeneutics	III
93	Pauri, M. (2003)	Philosophy of physics	Quantum theory	II
94	Pennock, R.T. (2002)	Philosophy	Creationism & school science	II
95	Pennock, R.T. (2010)	Philosophy	Postmodernism & intelligent design	III
96	Phillips, D.C. (2004)	Philosophy of science	Positivism & science education	III
97	Pinnick, C. (2008)	Philosophy of science	Feminist theory	II
98	Pospiech, G. (2003)	Physics education	Quantum mechanics & philosophy	III
99	Quale, A. (2002)	Science education	Metaphors & constructivism	II
100	Quale, A. (2007)	Science education	Radical constructivism & relativism	II
101	Quílez, J. (2009)	Chemistry education	Chemical equilibrium & historical context	III
102	Reisch, G. (2009)	Philosophy of science	Political engagement & philosophy of science	I
103	Roscoe, K. (2004)	Education	Constructivism	II
104	Rowell, J.A. (1993)	Science	Piagetian theory	III
105	Rowlands, S. (2010)	Mathematics education	Cultural-historical approach in teaching geometry	II

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No.	Authors in the reference	Author's area of research	Context of the study	Level
106	Rowlands, S., Graham, T., & Berry, J. (2011)	Mathematics education	Paul Ernest's philosophy of mathematics educations	III
107	Rusanen, A.-M., & Pöyhönen, S. (2013)	Philosophy	Mechanisms of conceptual change	IV
108	Schmaus, W. (2008)	Philosophy of science	Social location in science	I
109	Schulz, R.M. (2009)	Science education	Philosophy of science education	III
110	Schumacher, A., & Reiners, C.S. (2013)	Chemistry education	Authentic learning	III
111	Shibley, I.V. (2003)	Philosophy of science	Newspapers and nature of science	II
112	Sievers, K.H. (1999)	Philosophy	Understanding observation	IV
113	Silverman, M.P. (1992)	Physics	Controversy in science	IV
114	Skordoulis, C.D. (2008)	Physics education	Worldviews & Marxism	II
115	Slezak, P. (1994)	Philosophy of science	Sociology of scientific knowledge	I
116	Smith, M.U., Siegel, H., & McInerney, J.D. (1995)	Biology education	Evolution & creationism controversy	III
117	Stafford, E. (2004)	Science education	Pendulum & scientific reasoning	II
118	Stolberg, T.L. (2009)	Science education	Religious education & evolution	II
119	Suchting, W.A. (1992)	Philosophy of science	Radical constructivism	III
120	Suchting, W.A. (1994)	Philosophy of science	Cultural significance of science	II
121	Suchting, W.A. (1995)	Philosophy of science	Nature of scientific thought	II
122	Szybek, P. (2002)	Science education	Scientific knowledge & human experience	II
123	Takaacs, P., & Ruse, M. (2013)	Philosophy of biology	Philosophy of biology & its current status	III
124	Talanquer, V. (2013)	Chemistry education	Diversity in scientific thinking	III
125	Trumper, R. (2003)	Science education	Physics lab in a historical context	II
126	Uebel, T.E. (2004)	Philosophy of science	Education, enlightenment & positivism	III

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No.	Authors in the reference	Author's area of research	Context of the study	Level
127	Vermeir, K. (2013)	History of science	Commodification of science	IV
128	Vesterinen, V.-M., Aksela, M., & Lavonen, J. (2013)	Chemistry education	Nature of science in school science textbooks	II
129	Wan, Z.H., Wong, S.L., & Zhan, Y. (2013)	Science education	Marxism and nature of science	III
130	Wong, S.L., Kwan, J., Hodson, D., Jung, B.H. W. (2009)	Science education	Nature of science & SARS	IV
131	Yasri, P., Arthur, S., Smith, M.U., & Mancy, R. (2013)	Science education	Science & religion	III

Notes:

1. In the case of more than one author, area of research refers to that of the first author. For a description of Levels of classification (I, II, III, IV and V) see Chap. 3.

Appendix 3

Articles from the *Journal of Research in Science Teaching* (Wiley Blackwell) evaluated in this study

- Abd-El-Khalick, F., Waters, M., & Le, A.-P. (2008). Representations of nature of science in high school chemistry textbooks over the past four decades. *Journal of Research in Science Teaching*, 45(7), 835–855.
- Akerson, V.L., Abd-El-Khalick, F., & Lederman, N.G. (2000). Influence of a reflective explicit activity-based approach on elementary teachers' conceptions of nature of science. *Journal of Research in Science Teaching*, 37(4), 295–317.
- Akerson, V.L., Abd-El-Khalick, F., & McDuffie, A.R. (2006). One course is not enough: Preservice elementary teachers' retention of improved views of nature of science. *Journal of Research in Science Teaching*, 43(2), 194–213.
- Akerson, V.L., & Volrich, M.L. (2006). Teaching nature of science explicitly in a first-grade internship setting. *Journal of Research in Science Teaching*, 43(4), 377–394.
- Akerson, V.L., Buzzelli, C.A., & Donnelly, L.A. (2008). Early childhood teachers' views of nature of science: The influence of intellectual levels, cultural values, and explicit reflective teaching. *Journal of Research in Science Teaching*, 45(6), 748–770.
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Appendix 4

Distribution of articles (*Journal of Research in Science Teaching*) according to author's area of research, context of the study and level (classification)

No.	Authors in the reference	Author's area of research	Context of the study	Level
1	Abd-El-Khalick, F., Waters, M., & Le, A.-P. (2008)	Science education	Nature of science in chemistry textbooks	IV
2	Akerson, V.L., Abd-El-Khalick, F., & Lederman, N.G. (2000)	Science education	Teachers' conceptions of nature of science	III
3	Akerson, V.L., Morrison, J.A., & McDuffie, A.R. (2006)	Science education	Teachers' conceptions of nature of science	III
4	Akerson, V.L., & Volrich, M.L. (2006)	Science education	Teaching nature of science	III
5	Akerson, V.L., Buzzelli, C.A., & Donnelly, L.A. (2008)	Science education	Teachers' views of nature of science	III
6	Akerson, V.L., Cullen, T.A., & Hanson, D.L. (2009)	Science education	Teachers' views of nature of science	III
7	Baker, D., & Leary, R. (1995)	Science education	Science as a career for women	III
8	Barton, A.C. (1998)	Science education	Pedagogy, representation and identity	III
9	Barton, A.C., & Yang, K. (2000)	Science education	Culture of power and science education	III

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No.	Authors in the reference	Author's area of research	Context of the study	Level
10	Barton, A.C. (2001a)	Science education	Capitalism, critical pedagogy and science education	III
11	Barton, A.C. (2001b)	Science education	Critical ethnography and science education	III
12	Bartos, S.A., & Lederman, N.G. (2014)	Science education	Teachers' knowledge structures for nature of science	II
13	Bell, R.L., Blair, L.M., Crawford, B.A., & Lederman, N.G. (2003)	Science education	Science apprenticeship and nature of science	III
14	Ben-Zvi Assaraf, O., & Orion, N. (2005)	Science education	Earth system education	II
15	Ben-Zvi Assaraf, O., & Orion, N. (2010)	Science education	Developing system thinking skills	II
16	Bianchini, J.A., & Colburn, A. (2000)	Science education	Teaching nature of science to elementary teachers	III
17	Bianchini, J.A., Cavazos, L.M., Helms, J.V. (2000)	Science education	Gender and ethnicity in science education	III
18	Bianchini, J.A., Hilton-Brown, B.A., & Breton, T.D. (2002)	Science education	Dissent within community	III
19	Bianchini, J.A., Solomon, E.M. (2003)	Science education	Nature of science, equity and diversity	III
20	Bismack, A.S., Arias, A.M., Davis, E.A., & Palincsar, A.S. (2015)	Science education	Teacher uptake of educative curriculum materials	II
21	Boulton, A., & Panizzon, D. (1998)	Ecosystem management	Balancing practical and theoretical knowledge	III
22	Brickhouse, N. (2001)	Science education	Feminist perspective on learning	III
23	Briscoe, C. (1993)	Science education	Assessment practices	III
24	Brotman, J.S., & Moore, F.M. (2008)	Science education	Gender and science education	III
25	Carter, L. (2008)	Science education	Globalization, science and science education	III
26	Cavazos, L., et al. (1998)	Science education	Feminism and science education	III
27	Chen, S., et al. (2013)	Science education	Students' ideas about nature of science	IV
28	Chiappetta, E.L., Sethna, G.H., & Fillman, D.A. (1993)	Science education	Scientific literacy themes in textbooks	II

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No.	Authors in the reference	Author's area of research	Context of the study	Level
29	Christodoulou, A., & Osborne, J. (2014)	Science education	Teaching science based on arguments	II
30	Cobern, W.W. (1994)	Science education	Belief, understanding and teaching of evolution	III
31	Crawford, B.A., Zembal-Saul, C., Munford, D., & Friedrichsen, P. (2005)	Science education	Confronting teachers' ideas of evolution	III
32	Cronin, C., & Roger, A. (1999)	Education	Women in science, engineering and technology	III
33	Cross, R.T., & Price, R. F. (1996)	Science education	Role of controversial issues	III
34	DeBoer, G.E. (2000)	Science education	Scientific literacy and science education reform	II
35	Dori, Y.J., & Herscovitz, O. (1999)	Science education	Question-posing capability	II
36	Driver, R. (1997)	Science education	Science education theories	III
37	Duveen, J., & Solomon, J. (1994)	Science education	Teaching evolution in the classroom	III
38	Ebenezer, J., Kaya, O. N., & Ebenezer, D.L. (2011)	Science education	Engaging students in environmental research	III
39	Edmondson, K.M., & Novak, J.D. (1993)	Science education	Students' epistemological views and learning strategies	IV
40	Eflin, J.T., Glennan, S., & Reisch, G. (1999)	Philosophy of science	Nature of science	II
41	Feinstein, N.W. (2015)	Science education	Science in the public sphere	I
42	Florence, M.K., & Yore, L.D. (2004)	Writing and editing	Learning to write like a scientist	II
43	Fosnot, C.T. (1993)	Teacher education	Piagetian constructivism	III
44	Fusco, D., & Barton, A. C. (2001)	Science education	Student achievement in science	III
45	Fusco, D. (2001)	Science education	Creating relevant science	III
46	Gazley et al. (2014)	Medicine	Graduate school and biomedical sciences	II
47	Germann, P.J., Aram, R., & Burke, G. (1996)	Science education	Science process skills	II

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No.	Authors in the reference	Author's area of research	Context of the study	Level
48	Good, R. (1993)	Science education	Postmodernism and science education	III
49	Grindstaff, K., & Richmond, G. (2008)	Science education	Role of peers in research	I
50	Harding, P., & Hare, W. (2000)	Science education	Open-mindedness versus relativism	IV
51	Hashweh, M.Z. (1996)	Science education	Epistemological beliefs of science teachers	III
52	Havdala, R., & Ashkenazi, G. (2007)	Science education	Coordination of theory and evidence	III
53	Hildebrand, G.M. (1998)	Science education	Hegemonic writing practices in school science	III
54	Hogan, K., & Maglienti, M. (2001)	Science education	Underpinnings of students' and scientists' reasoning	III
55	Howes, E.V. (1998)	Teacher education	Feminism and prenatal testing	III
56	Hughes, G. (2000)	Science education	Marginalization of socio-scientific issues	IV
57	Jackson, D.F., Doster, E. C., Meadows, L., & Wood, T. (1995)	Science education	Education of a confirmed evolutionist	III
58	Jones, M.G., et al. (2007)	Science education	Students' engagement with nanotechnology	II
59	Kawagley, A.O., Norris-Tull, D., & Norris-Tull, R.A. (1998)	Science education	Indigenous worldview of Yupiaq culture	III
60	Keig, P.F., & Rubba, P. A. (1993)	Science education	Translation of representations of structure of matter	II
61	Kelly, G.J., Chen, C., & Prothero, W. (2000)	Science education	Epistemological framing of oceanography	II
62	Kittleson, J.M., & Southerland, S.A. (2004)	Science education	Role of discourse and knowledge construction	III
63	Kyle, W.C., Abell, S.K., Roth, W.-M., & Gallagher, J.J. (1992).	Science education	Science education as a mature discipline	III
64	Lather, P. (1998)	Feminist ethnography	Hegemonic writing practices in school science	III
65	Liu, O.L., Lee, H.-S., & Linn, M.C. (2011)	Educational assessment	Measuring knowledge integration	II

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No.	Authors in the reference	Author's area of research	Context of the study	Level
66	Liu, O.L., et al. (2016)	Educational assessment	Validation of automated scoring	II
67	Lynch, S. (1994)	Science education	Ability grouping and science education reform	II
68	Lynch, S. (1997)	Science education	Teachers and national science education reform	II
69	Matthews, M.R. (1998)	Science education	Teaching about nature of science	I
70	Mayberry, M. (1998)	Women's studies	Feminist pedagogy in science education	III
71	Nentwig, P., et al. (2009)	Science education	Performance of OECD countries in PISA	II
72	Niaz, M. (2000)	Science education	Presentation of oil drop experiment in chemistry textbooks	III
73	Nicolaidou et al. (2011)	Communication & internet studies	Scaffolding students' assessment	II
74	Norman, O. (1998)	Science education	Marginalized discourses	III
75	Norman, O. et al. (2001)	Science education	The black-white achievement gap in urban science education	III
76	O'Loughlin, M. (1992)	Teacher education	Sociocultural model of teaching and learning	III
77	Osborne, J., et al. (2003)	Science education	Ideas-about-science and school science	II
78	Polman, J.L., & Gebre, E.H. (2015)	Science education	Infographics as scientific inscriptions	II
79	Richmond, G., et al. (1998)	Teacher education	Feminist pedagogy and science teacher education	III
80	Ritchie, S.M., Tobin, K., & Hook, K.S. (1997)	Science education	Viability of students' mental models	III
81	Roth, W.-M., & Roychoudhury, A. (1993)	Science education	Science process skills in authentic contexts	II
82	Roth, W.-M. (1993)a	Science education	Heisenberg's uncertainty principle and science education	III
83	Roth, W.-M. (1993)b	Science education	Constructivism and science education research	III

(continued)

(continued)

No.	Authors in the reference	Author's area of research	Context of the study	Level
84	Roth, W.-M., & Roychoudhury, A. (1994)	Science education	Physics students' epistemologies	II
85	Roth, W.-M., & Lucas, K.B. (1997)	Science education	Physics students' talk about scientific knowledge	III
86	Roth, W.-M., & McGinn, M.K. (1998)	Science education	Grading practices and science education	III
87	Sadler, T.D. (2004)	Science education	Informal reasoning and socioscientific issues	II
88	Sadler, T.D. et al. (2006)	Science education	Teacher perspectives on socioscience and ethics	III
89	Schroeder, C.M. (2007)	Science education	Teaching strategy and student achievement	II
90	Sencar, S., & Eryilmaz, A. (2004)	Science education	Gender and misconceptions concerning electric circuits	II
91	Shanahan, M.-C., & Nieswandt, M. (2011)	Science education	Social structural norms of school science	III
92	Showers, D.E., & Shrigley, R.L. (1995)	Science education	Students' attitudes toward nuclear power plants	II
93	Shumba, O., & Glass, L. W. (1994)	Science education	Perceptions of high school chemistry coordinators	II
94	Siegel, M.A., & Ranney, M.A. (2003)	Science education	Changes in attitude about the relevance of science	II
95	Smith, C.L., & Wenk, L. (2006)	Psychology	College students' epistemologies of science	II
96	Smith, M.U. (1994)	Science education	Belief, understanding, and the teaching of evolution	III
97	Snyder, V.L., & Broadway, F.S. (2004)	Science education	Queer theory and biology textbooks	III
98	Staver, J.R. (1995)	Science education	Understanding radical constructivism	III
99	Tomas, L., Ritchie, S. M., & Tones, M (2011)	Science education	Hybridized writing about socioscientific issues	III
100	Tsui, C.-Y., & Treagust, D.F. (2007)	Science education	Rigor of qualitative research	III

(continued)

(continued)

No.	Authors in the reference	Author's area of research	Context of the study	Level
101	van Eijck, M., & Roth, W.-M. (2011)	Science education	Cultural diversity in science education	I
102	Venville, G. (2004)	Science education	Young children learning about living things	III
103	Verma, G., Puvirajah, A., & Webb, H. (2015)	Science education	Authentication in a robotics competition	III
104	Warren, B., et al. (2001)	Science education	Rethinking diversity in learning science	III
105	Wenner, J.A., & Settlage, J. (2015)	Science education	School leadership and structure/agency dialectic	III
106	Wilson, R.E., & Kittleson, J. (2013)	Science education	Science as a class and gendered endeavor	III
107	Yerrick, R.K. (2000)	Science education	Students' argumentation and inquiry instruction	III
108	Yore, L.D., Hand, B.M., & Florence, M.K. (2004)	Science education	Scientists' writing practices	III
109	Zembylas, M. (2002)	Science education	Teachers' emotions in science teaching	III
110	Zoller, U. (1999)	Science education	Higher-order cognitive skills in teaching chemistry	III

Notes:

1. In the case of more than one author, area of research refers to that of the first author.
2. For a description of Levels of classification (I, II, III, IV and V) see Chap. 3

Appendix 5

Articles from the *International Handbook of Research in History, Philosophy and Science Teaching* (Springer) evaluated in this study

- Galili, I. (2014). Teaching optics: A historico-philosophical perspective. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. I, pp. 97–128). Dordrecht: Springer.
- Glas, E. (2014). A role for quasi-empiricism in mathematics education. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. I, pp. 731–753). Dordrecht: Springer.
- Horsthemke, K., & Yore, L.D. (2014). Challenges of multiculturalism in science education: Indigenisation, internationalism, and *transkulturalität*. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. III, pp. 1759–1792). Dordrecht: Springer.
- Mackenzie, J., Good, R., & Brown, J.R. (2014). Postmodernism and science education: An appraisal. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. II, pp. 1057–1086). Dordrecht: Springer.
- McCarthy, C.L. (2014). Cultural studies in science education: Philosophical considerations. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. III, pp. 1927–1964).
- Reiss, M.J. (2014). What significance does Christianity have for science education? In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. II, pp. 1637–1662). Dordrecht: Springer.
- Schulz, R.M. (2014). Philosophy of education and science education: A vital but underdeveloped relationship. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. II, pp. 1259–1316). Dordrecht: Springer.
- Taber, K.S. (2014). Methodological issues in science education research: A perspective from the philosophy of science. In M.R. Matthews (Ed.), *International Handbook of Research in History, Philosophy and Science Teaching* (Vol. III, pp. 1839–1893). Dordrecht: Springer.

Appendix 6

Distribution of articles (*International Handbook of Research in History, Philosophy and Science Teaching*) according to author's area of research, context of the study and level (classification)

No.	Authors in the reference	Author's area of research	Context of the study	Level
1	Galili, I. (2014)	Science education	Teaching optics	III
2	Glas, E. (2014)	Mathematics	Mathematics education	III
3	Horsthemke, K., & Yore, L.D. (2014)	Education	Multiculturalism	II
4	Mackenzie, J., Good, R., & Brown, J.R. (2014)	Education	Feminism and science	III
5	McCarthy, C.L. (2014)	Philosophy of education	Cultural studies	IV
6	Reiss, M.J. (2014)	Science education	Nature of science	II
7	Schulz, R.M. (2014)	Science education	Philosophy of science	II
8	Taber, K.S. (2014)	Science education	Research methodology	II

Notes:

1. In the case of more than one author, area of research refers to that of the first author.
2. For a description of Levels (I, II, III, IV & V) see Chap. 3.

Appendix 7

Articles from *Encyclopedia of Science Education* (Springer) evaluated in this study

- Alsop, S. (2015). Affect in learning science. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 19–24). Heidelberg: Springer.
- Brickhouse, N. (2015). Gender. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 440–441). Heidelberg: Springer.
- Cavas, B. (2015). Values. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 1089–1090). Heidelberg: Springer.
- Corrigan, D. (2015). Curriculum and values. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 256–258).
- Fischler, H. (2015). Bildung. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 118–122).
- Irzik, G. (2015). Values and Western science knowledge. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 1093–1096). Heidelberg: Springer.
- Reiss, M.J. (2015). Religious education and science education. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 831–834). Heidelberg: Springer.
- Robinson, D. (2015). Broadcast media. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 135–138). Heidelberg: Springer.
- Rudolph, J.L. (2015). Science studies. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 914–917). Heidelberg: Springer.
- Scantlebury, K. (2015). Sociocultural perspectives and gender. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 983–985). Heidelberg: Springer.
- Stewart, G.M. (2015). Ethnoscience. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 401–402). Heidelberg: Springer.
- Taylor, P.C. (2015). Constructivism. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 218–224). Heidelberg: Springer.

Appendix 8

Distribution of articles (*Encyclopedia of Science Education*) according to author's area of research, context of the study and level (classification)

No.	Authors in the reference	Author's area of research	Context of the study	Level
1	Alsop, S. (2015)	Science education	Affect in learning science	IV
2	Brickhouse, N. (2015)	Science education	Gender	III
3	Cavas, B. (2015)	Science education	Values	II
4	Corrigan, D. (2015)	Education	Curriculum and values	III
5	Fischler, H. (2015)	Science education	Bildung	II
6	Irzik, G. (2015)	Philosophy of science	Values and Western science	III
7	Reiss, M.J. (2015)	Science education	Religious education	II
8	Robinson, D. (2015)	Science education	Broadcast media	II
9	Rudolph, J.L. (2015)	Science education	Science studies	II
10	Scantlebury, K. (2015)	Science education	Sociocultural perspectives & gender	II
11	Stewart, G.M. (2015)	Science education	Ethnoscience	III
12	Taylor, P.C. (2015)	Science education	Constructivism	IV

Note:

1. For a description of Levels (I, II, III, IV & V) see Chap. 3.

Appendix 9

General chemistry textbooks (published in USA) evaluated in this study ($n = 60$)

- Armstrong, J. (2012). *General, organic and biochemistry: An applied approach*. Belmont, CA: Brooks/Cole.
- Atkins, P., & Jones, L. (2002). *Chemical principles: The quest for insight* (2nd ed.). New York: Freeman.
- Atkins, P., & Jones, L. (2008). *Chemical principles: The quest for insight* (4th ed.). New York: Freeman.
- Bettelheim, F.A., Brown, W.H., Campbell, M.K., & Farrell, S.O. (2010). *Introduction to general, organic and biochemistry* (9th ed.). Belmont, CA: Brooks/Cole.
- Bishop, M. (2002). *An introduction to chemistry*. San Francisco: Benjamin Cummings.
- Blei, I., & Odian, G. (2006). *General, organic and biochemistry: Connecting chemistry to your life* (2nd ed.). New York: W.H. Freeman.
- Brady, J.E., & Humiston, G. (1996). *General chemistry: Principles and structure* (Spanish ed.). New York: Wiley.
- Brady, J.E., Russell, J., & Holum, J. (2000). *Chemistry: The study and its changes* (3rd ed.). New York: Wiley.
- Brady, J.E., & Senese, F.A. (2009). *Chemistry: Matter and its changes* (5th ed.). Hoboken, NJ: Wiley.
- Brown, L.S., & Holme, T.A. (2011). *Chemistry for engineering students* (2nd ed.). Belmont, CA: Brooks/Cole.
- Brown, T.L., LeMay, H.E., & Bursten, B. (1997). *Chemistry: The central science* (7th ed., Spanish). Englewood Cliffs, NJ: Prentice Hall.
- Brown, T.L., LeMay, H.E., Bursten, B.E., & Murphy, C.J. (2009). *Chemistry: The central science* (11th ed., Spanish). Englewood Cliffs, NJ: Prentice Hall.
- Brown, T.L., LeMay, H.E., Bursten, B.E., Murphy, C.J., & Woodward, P. (2014). *Chemistry: The central science* (12th ed.). Essex, UK: Pearson International Education edition.
- Burns, R. (1995). *Fundamentals of chemistry* (2nd ed., Spanish). Englewood Cliffs, NJ: Prentice Hall.
- Chang, R. (1998). *Chemistry* (6th ed., Spanish). New York: McGraw Hill.
- Chang, R. (2010). *Chemistry* (10th ed., Spanish). New York: McGraw Hill.
- Cracolice, M.S., & Peters, E. (2016). *Introductory chemistry: An active learning approach* (6th ed.). Boston, MA: Cengage Learning.
- Daub, G.W., & Seese, W. (1996). *Basic chemistry* (8th ed., Spanish). Englewood Cliffs: Prentice Hall.

- Denniston, K.J., Topping, J.J., & Caret, R.L. (2011). *General, organic and biochemistry* (7th ed.). New York: McGraw Hill.
- Dickson, T. (2000). *Introduction to chemistry* (8th ed.). New York: Wiley.
- Ebbing, D.D. (1996). *General chemistry* (5th ed., Spanish). New York: McGraw Hill.
- Ebbing, D.D., & Gammon, S.D. (2013). *General chemistry* (10th ed.). Belmont, CA: Brooks/Cole.
- Ebbing, D.D., & Gammon, S.D. (2017). *General chemistry* (11th ed.). Boston, MA: Cengage Learning.
- Ellis, A.B., Geselbracht, M.J., Johnson, B.J., Lisensky, G.C., & Robinson, W.R. (1993). *Teaching general chemistry: A materials science companion*. Washington, D.C.: American Chemical Society.
- Frost, L., Deal, T., & Timberlake, K.C. (2011). *General, organic and biological chemistry: An integrated approach*. Upper Saddle River, NJ: Prentice Hall.
- Garoutte, M.P., & Mahoney, A.B. (2015). *Introductory chemistry: A guided inquiry*. Hoboken, NJ: Wiley.
- Goldberg, D.E. (2001). *Fundamentals of chemistry* (3rd ed.). New York: McGraw Hill.
- Hein, M. (1990). *Foundations of college chemistry*. Belmont, CA: Brooks/Cole.
- Hein, M., & Arena, S. (1997). *Foundations of college chemistry*. Belmont, CA: Brooks/Cole.
- Hill, J., & Petrucci, R. (1999). *General chemistry: An integrated approach* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Joesten, M.D., Castellion, M.E., & Hogg, J.L. (2007). *The world of chemistry: Essentials* (4th ed.). Belmont, CA: Brooks/Cole.
- Joesten, M. D., Johnstone, D.O., Nettekville, J.T., & Wood, J.L. (1991). *World of chemistry*. Philadelphia: Saunders.
- Jones, L., & Atkins, P. (2000). *Chemistry: Molecules, matter and change* (4th ed.). New York: Freeman.
- Kotz, J.C., Treichel, P.M., Townsend, J.R., & Treichel, D.A. (2015). *Chemistry and chemical reactivity* (9th ed.). Stamford, CT: Cengage Learning.
- Malone, L.J. (2001). *Basic concepts of chemistry* (6th ed.). New York: Wiley.
- Malone, L.J., & Dolter, T.O. (2013). *Basic concepts of chemistry* (9th ed.). Hoboken, NJ: Wiley.
- Masterton, W.L., Hurley, C.N., & Neth, E.J. (2012). *Chemistry: Principles and reactions* (7th ed.). Belmont, CA: Brooks/Cole.
- McMurry, J., Castellion, M.E., & Ballantine, D.S. (2007). *Fundamentals of general, organic and biological chemistry* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- McMurry, J., & Fay, R. (2001). *Chemistry* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Mcquarrie, D.A., Rock, P.A., & Gallogly, E.B. (2011). *General chemistry* (4th ed.). Mill Valley, CA: University Science Books.
- Moore, J.W., Stanitski, C.L., & Jurs, P.C. (2002). *Chemistry: The molecular science*. Orlando, FL: Harcourt College Publishers.
- Moore, J.W., Stanitski, C.L., & Jurs, P.C. (2011). *Chemistry: The molecular science* (4th ed.). Belmont, CA: Brooks/Cole.
- Olmsted, J.A., & Williams, G.M. (2006). *Chemistry* (4th ed.). Hoboken, NJ: Wiley.
- Oxtoby, D.W., Gillis, H.P., & Campion, A. (2012). *Principles of modern chemistry* (7th ed.). Belmont, CA: Brooks/Cole.
- Oxtoby, D.W., Nachtrieb, N., & Freeman, W. (1990). *Chemistry: Science of change* (2nd ed.). Philadelphia: Saunders.
- Raymond, K.W. (2010). *General, organic and biological chemistry: An integrated approach* (3rd ed.). Hoboken, NJ: Wiley.
- Russo, S., & Silver, M. (2002). *Introductory chemistry* (2nd ed.). San Francisco: Benjamin Cummings.
- Seager, S.L., Slabaugh, M.R. (2011). *Chemistry for today: General, organic and biochemistry*. Belmont, CA: Brooks/Cole.
- Silberberg, M. (2000). *Chemistry: The molecular nature of matter and change* (2nd ed.). New York: McGraw Hill.

- Spencer, J.N., Bodner, G.M., & Rickard, L.H. (1999). *Chemistry: Structure and dynamics*. New York: Wiley.
- Spencer, J.N., Bodner, G.M., & Rickard, L.H. (2012). *Chemistry: Structure and dynamics* (5th ed.). Hoboken, NJ: Wiley.
- Stoker, H.S. (2010). *General, organic and biological chemistry* (5th ed.). Belmont, CA: Brooks/Cole.
- Stoker, H.S. (2016). *General, organic and biological chemistry* (7th ed.). Boston, MA: Cengage Learning.
- Timberlake, K.C. (2010). *General, organic and biological chemistry: Structures of life* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Tro, N.J. (2008). *Chemistry: A molecular approach*. Upper Saddle River, NJ: Prentice Hall.
- Umland, J., & Bellama, J. (1999). *General chemistry* (3rd ed.). Pacific Grove, CA: Brooks/Cole.
- Whitten, K.W., Davis, R.E., Peck, M.L., & Stanley, G.G. (2010). *Chemistry* (10th ed.). Belmont, CA: Brooks/Cole.
- Zumdahl, S.S., & Decoste, D.J. (2015). *Introductory chemistry: A foundation* (8th ed.). Stamford, CT: Cengage Learning.
- Zumdahl, S.S., & Zumdahl, S.A. (2007). *Chemistry* (7th ed.). Boston, MA: Houghton Mifflin Co.
- Zumdahl, S.S., & Zumdahl, S.A. (2014). *Chemistry* (9th ed.). Belmont, CA: Brooks/Cole.

Appendix 10

Evaluation of general chemistry textbooks published in USA ($n = 60$)

No.	Textbook Points ^b	Criteria ^a					
		1	2	3	4	5	
1	Armstrong (2012)	N	N	N	N	N	0
2	Atkins & Jones (2002)	N	M	S	S	M	6
3	Atkins & Jones (2008)	N	M	S	S	S	7
4	Bettelheim et al (2010)	N	S	N	N	M	3
5	Bishop (2002)	N	N	N	N	N	0
6	Blei & Odian (2006)	N	M	N	N	N	1
7	Brady & Humiston (1996)	N	N	N	N	N	0
8	Brady, Russell & Holum (2000)	N	M	N	N	N	1
9	Brady & Senese (2009)	N	S	S	N	S	6
10	Brown & Holme (2011)	N	S	N	N	S	4
11	Brown, LeMay & Bursten (1997)	N	M	N	N	N	1
12	Brown, LeMay, Bursten & Murphy (2009)	N	M	M	N	S	4
13	Brown et al. (2014)	N	M	N	N	S	3
14	Burns (1995)	N	N	N	N	N	0
15	Chang (1998)	N	M	N	N	S	3
16	Chang (2010)	N	M	N	N	S	3
17	Cracolice & Peters (2016)	N	S	M	M	S	6
18	Daub & Seese (1996)	N	N	N	N	N	0
19	Denniston, Topping & Caret (2011)	N	S	M	N	N	3

(continued)

(continued)

20	Dickson (2000)	N	N	S	N	N	2
21	Ebbing (1996)	N	M	M	N	N	2
22	Ebbing & Gammon (2013)	N	M	M	M	N	3
23	Ebbing & Gammon (2017)	N	M	M	S	M	5
24	Ellis et al (1993)	N	N	M	M	M	3
25	Frost, Deal & Timberlake (2011)	N	N	N	N	N	0
26	Garouttte & Mahoney (2015)	N	N	N	N	N	0
27	Goldberg (2001)	N	N	N	N	N	0
28	Hein (1990)	N	M	N	N	N	1
29	Hein & Arena (1997)	N	M	M	M	N	3
30	Hill & Petrucci (1999)	N	M	S	N	M	4
31	Joesten, Castellion & Hogg (2007)	N	N	S	M	N	3
32	Joesten et al (1991)	M	S	M	N	N	4
33	Jones & Atkins (2000)	N	N	N	N	S	2
34	Kotz, et al (2015)	S	S	S	N	M	7
35	Malone (2001)	N	N	N	N	N	0
36	Malone & Dolter (2013)	N	M	N	N	N	1
37	Masterton, Hurley & Neth (2012)	N	N	N	N	N	0
38	McMurry, Castellion & Ballantine (2007)	N	N	S	N	N	2
39	McMurry & Fay (2001)	N	N	S	N	M	3
40	Mcquarrie, Rock & Gallogly (2011)	N	N	N	N	N	0
41	Moore, Stanitski & Jurs (2002)	N	N	S	N	N	2
42	Moore, Stanitski & Jurs (2011)	N	N	S	S	S	6
43	Olmsted & Williams (2006)	N	M	S	S	S	7
44	Oxtoby, Gillis & Champion (2012)	N	N	S	S	M	5
45	Oxtoby, Nachtrieb & Freeman (1990)	N	N	S	N	N	2
46	Raymond (2010)	N	M	N	N	N	1
47	Russo & Silver (2002)	N	N	M	N	N	1
48	Seager & Slabaugh (2011)	N	N	N	N	M	1
49	Silberberg (2000)	N	M	M	N	S	4
50	Spencer, Bodner & Rickard (1999)	N	N	M	N	N	1
51	Spencer, Bodner & Rickard (2012)	N	N	M	N	S	3
52	Stoker (2010)	N	N	N	N	N	0
53	Stoker (2016)	N	N	N	N	N	0
54	Timberlake (2010)	N	M	N	N	N	1
55	Tro (2008)	S	S	M	N	S	7
56	Umland & Bellama (1999)	N	N	S	S	M	5
57	Whitten, Davis, Peck & Stanley (2010)	N	N	N	N	N	0

(continued)

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58	Zumdahl & DeCoste (2015)	S	S	M	N	S	7
59	Zumdahl & Zumdahl (2007)	S	S	M	N	N	5
60	Zumdahl & Zumdahl (2014)	S	S	M	N	M	6

^aCriteria: (for details see text)

1. Objectivity
2. Scientific method
3. Scanning tunneling microscopy (STM)
4. Atomic force microscopy (ATM)
5. From representation to presentation: Scientific progress at a crossroads

S = Satisfactory, M = Mention, N = No mention

^bPoints

S = 2 points, M = 1 point, N = 0 points

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