Bar-Ilan University אוניברסיטת בר-אילן

CURRICULUM VITAE

Michal Zion (Oppenheimer)

PERSONAL DATA

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EDUCATION

1987	Studied towards the degree in biology (B.Sc.) in the Hebrew University, Jerusalem: Graduated with excellence
1993	Teaching diploma in biology, School of Education, Hebrew University, Jerusalem
1994	Direct doctorate (Ph.D.) program in the School of Medicine at the Hebrew University, Jerusalem Thesis: The regulation of human *abl* gene expression in Philadelphia positive leukemic cells in comparison to normal cells Supervisor: Prof. Yinon Ben-Neriah
1997	Completed the course for leading teachers in the Biology Teachers' Center, Hebrew University, Jerusalem

ACADEMIC APPOINTMENTS

1985-1988	Assistant research in the lab of Prof. Ruth Gallily, the School of Medicine at the Hebrew University, Jerusalem. Researched: The killing of cancer cells by activated macrophages (20 % work percentage).
1990-1994	Coordinated the youth advocate microbiology courses at the School of Medicine, Hebrew University, Jerusalem (10 % work percentage).
2000-2007	Lecturer at the School of Education, Bar-Ilan University, Member of the M.A. Committee and Coordinator of the Science Education Program and the Biology Teaching Program, The School of Education, Bar-Ilan University (100% work percentage).

2005-2006 Sabbatical fellowship, at the Science and Mathematics Education Centre (SMEC), Curtin University of Technology, Perth, Western Australia (100 % work percentage).

2008-2015 Senior Lecturer at the School of Education, Bar-Ilan University, Member of the M.A. Committee and Coordinator of the Science Education Program and the Biology Teaching Program, The School of Education, Bar-Ilan University (100% work percentage).

2016-2019 Deputy Head, Chair of the Internal Committee of BA and MA degrees, School of Education, Bar-Ilan University.

2015-to date Associate professor, and Coordinator of the Biology Teaching Program, The School of Education, (100% work percentage).

PROFESSIONAL FUNCTIONS

International Invited lectures

1. Two plenary lectures and two workshops in the second action of the program "Education and Training 2010" (funded by the European Union as a part of the National Action Plan for the Promotion of the Lisbon Strategy). Nov. 2007.

2. Special seminars for graduate students in the Department of Education, University of Cyprus, Nov. 25-27 2009.

3. A seminar in the Department of Chemistry and Biochemistry, Florida State University (FSU), Tallahassee, USA. Sept. 2012.

4. A seminar in the College of Education, University of Georgia, USA. Sept. 2012.

5. A seminar in the Department of Chemistry, University of Massachusetts, Boston, USA. March 2014.

6. A seminar in the CREATE for STEM Institute, Michigan State University, Lansing, USA. March 2014.

7. A seminar in the Department of Biological Sciences, Western Michigan University, Kalamazoo, Michigan, USA. March 2014.

8. A seminar in Science Symposium with the theme of Engagement in Science taking place at the on the 22nd of October 2016 at The Global Centre in The Hague, The Netherlands.

Academic Affiliations

- AERA - American Educational Research Association
- EARLY - The European Association for Research on Learning and Instruction
- ERIDOB - European Researchers in Didactics of Biology
- ESERA - The European Science Education Research Association
- IOSTE - The International Organization for Science and Technology Education

- NARST - The National Association for Research in Science Teaching
- EARLY - The European Association for Research on Learning and Instruction

PROFESSIONAL FUNCTIONS

1981-1983	Military service as a soldier teacher in the 'Har Gilo' field school, the Society of Nature Protection.
1983-1984	Guide in the 'Har Giloh' field school, the Society of Nature Protection.
1994-1996	Biology teacher and educator at the Fifth Municipality High School, Tel-Aviv.
1996-1997	Head of the Science teachers team at the First Municipality High school, Modiin. Coordinated science studies.
1996-2000	Head of environmental studies at the Council for a Beautiful Israel.
1997-2000	Teacher and educator at the Fifth Municipality High School, Tel Aviv: Coordinated science studies, taught biology.
1998-2001	Led the "Young Researchers" Project in collaboration with the youth activities unit at the Weizmann Institute for Science.
1998-2003	Participated in designing the Biomind Curriculum, Israel Ministry of Education.
1999-2006	Member of The Biology Curriculum Committee, The Israel Ministry of Education.
2000-2017	Academic Head of Science Education program, The School of Education, Bar-Ilan University.
2000-2003	Coordinated the environmental project and the "Science for Gifted Students" program, at the Second Municipality High School in Modiin.
2003-2004	Academic and administrative director of the international MEAL (Mediterranean; Environment; ALN; Learning education project). See website: http://www.linet-pro.net/nodeweb.asp?t=24986&selLang=1.
2004- 2006	Member of The Elementary School Science and Technology Committee, The Israel Ministry of Education.
2006-2009	Member of The Pronunciation Committee of Youth Activities, Bar-Ilan University, Israel.
2001-2013	Member of The Pronunciation Committee of The National Biology Teachers' Center, The Science Education Center, Israel.
2012-2015	Member of the Simulation Center Committee, The School of Education, Bar-Ilan University.

2011-2016	Academic head of the department internet site, The School of Education, Bar-Ilan University.
2014-2019	Vice Director, The School of Education, Bar-Ilan University.
2004-to date	Member of The Biology High School Committee, The Israel Ministry of Education.
2011-to date	Academic Head of The National Center for Support and Development of Biology School Laboratories.
2014-to date	Academic Head of Science Education Center, Bar-Ilan University.
2016-to date	Coordinator of the Israeli Forum for Research in Biology Education.
2018-to date	Early Career Research Subcommittee member - A worldwide organization for improving science teaching and learning through research.
2015-to date	Head of Intelligence Population Team in the Rescue and Save Unit of the Modi'in Maccabim Reut Municipality (on a voluntary basis)

AWARDS

1984	Award of Excellence, the Dean of Life Sciences, The Hebrew University, Jerusalem.
1985	Award of Excellence, the Rector of the Hebrew University, Jerusalem.
1987	Wolfe Award of Excellence, The Hebrew University, Jerusalem.
2000	Award of Excellence, The Israel Ministry of Education.
2001-2004	Guastalla Fellowship, Sacta-Rashi Foundation, Israel. Three year scholarship for promising researcher in mathematics and science education (Peer-reviewed external funding).
2017	The Rector Price for Scientific Innovation

GRANTS

1. *Homeostasis at the molecular level* (2000-2003). Funded by The Center for Science Education, The Israel Ministry of Education. In this project, computerized interactive tools were constructed for the teaching of a central concept in biology: Homeostasis on the molecular level. The tools incorporated breakthrough scientific discoveries in the field of gene expression control. The interactive tools included: animations, thinking games, a virtual lab, and a library. The learning tools are intended for the use of high school students majoring in biology and support the biology curriculum. See website: www.hs.ph.biu.ac.il.

2. *Ecological inquiry under metacognitive guidance* (2002). Funded by The Pedagogical Secretary, The Israel Ministry of Education.

3. *Support group workshops for teachers as a model for pedagogical infrastructure for the teaching/learning of dynamic inquiry* (2003). Funded by The Pedagogical Secretary, The Israel Ministry of Education.

4. *Homeostasis in the human body* (2003-2005). Funded by The Center for Science Education, The Israel Ministry of Education. In this project, computerized interactive tools were constructed for the teaching of a central concept in biology: Homeostasis of the entire organism. The computerized tools emphasize the systemic combination of the human body required for the proper functioning of the organism as a whole. See website: www.hhs.ph.biu.ac.il.

5. *Implementation of ecological and environmental scientific* knowledge *in the crater region* (2003-2005). The Israel Ministry of Science and Technology. Together with MOP Ramon Center.

6. *Inquiry learning project: "Beyond guided inquiry"* (2004-2005). Funded by The Pedagogical Secretary, The Israel Ministry of Education.

7. *Influence of invasive birds on the local bird biodiversity (migrant and resident) in Israel* (2005). The Israel Ministry of Science and Technology. Together with Dr. Salit Kark, Faculty of Life Sciences, The Hebrew University, Jerusalem.

8. *Development of science and ecological literacy by participation in long term climate geographic and ecological monitoring in the crater region* (2008-2010). The Israel Ministry of Science and Technology. Together with MOP Ramon Center.

9. *Developing environmental literacy through metacognitive instruction and collaborative inquiry* (2010-2013). Israel Science Foundation.

10. *We only have one Earth* (2011-2013). Updating and rewriting of the learning books intended for the use of high school students majoring in environmental science. The Israel Ministry of Education.

11. *We only have one Earth* (2014-2016). Translation to Arabic of the learning books intended for the use of high school students majoring in environmental science. The Israel Ministry of Education.

12. The National Center for Support and Development of Biology School Laboratories (1012-2016). The Israel Ministry of Education.

13. *Ethics and Environment* (2016-2017). Translation to Arabic of the learning books intended for the use of high school students majoring in environmental science. The Israel Ministry of Education.

14. *Environment and Human* (2016-2017). Translation to Arabic of the learning books intended for the use of high school students majoring in environmental science. The Israel Ministry of Education.

15. *The National Center for Support and Development of Biology School Laboratories* (1017-2020). The Israel Ministry of Education.

16. *Teaching with the Heart and Mind: An Integrative Whole School Model for Sustainable Socio-Emotional and Cognitive Deep Learning in Elementary Schools* (2017-2021). Israel Science Foundation. Together with Haifa University.

17. Accommodating Students' Needs in Science Studies - a Multi-Faceted Holistic Teaching Approach (2018-2020). Together with Dr. Ornit Spektor-Levi. The Chief Scientist, Israel Ministry of Education.

TEACHING EXPERIENCE

Courses in the Bar-Ilan M.A. Science Education Program, School of Education:

1. Introduction to the research of curricula in science education 77-927 (up to 2006)
2. Issues in science education 77-920 (up to 2006)
3. Teaching by inquiry – theory and practice 77-958 (up to 2013)
4. Summary project in science education 77-994 (up to 2015)
5. Biology teaching pedagogy 79-435
6. Biology teaching pedagogy - laboratory 79-436
7. Cognition and Metacognition - 77783

MAIN RESEARCH INTERESTS

1. Inquiry-based learning and teaching
2. Biology education
3. Developing scientific environmental and health literacy
4. Metacognition
5. Homeostasis - a fundamental principle in biology education
6. Computer-based learning environment

ADDITIONAL INFORMATION

- Evaluator of papers in the following peer-revived journals: Science *Education, Journal of Research in Science Teaching journal, Cell Biology Education, International Journal of Science & Math Education, Computers and Education.*

- Patent Application. Ben-Neriah, Y., Zion, M., Avraham, A. & Ben-Yehuda, D. Assay for monitoring the progress of CML. Yissum Research Development Company of the Hebrew Uni, Jerusalem No. 108978, 15/3/94.

SUPERVISION OF GRADUATE STUDENTS

M.A. Students:

In the past:

1. Semadar Cohen (2005) - Characterizing the conception of inquiry of teachers teaching the Biomind curriculum.
2. Martha Porat (2008) - The Contribution of the Course "Teachers' community for educational and environmental leadership" to develop educators' environmental literacy.
3. Ilana Schanin (2009) - Characterization of teachers' understanding the essence of the inquiry process and the nature of science, while experiencing an open inquiry task.
4. Oshra Aloni (2009) – Science and technology mini-museum at high school: an authentic learning environment for development of scientific knowledge, self-efficacy and positive attitudes towards science among students (together with Dr. Ornit Spektor-Levy).
5. Ravit Sarusi (2011) - Explicit instruction of the skill "Reading complex visual representations": The impact on scientific knowledge, the skill's implementation and transfer among high school girls (together with Dr. Ornit Spektor-Levy).
6. Yael Gilat (2012) - The impact of learning with laptops in 1:1 classes on the development of learning skills and information literacy among middle school students (together with Dr. Ornit Spektor-Levy).
7. Miada Daboor (2012) - Implementing the new curriculum in Chemistry: achieving goals in developing the skills of reading a scientific text and difficulties of the experimental teachers (together with Dr. Zvia Fund).
8. Ety Rimerman Shemuali (2013) - Dynamic inquiry performance, metacognitive awareness and understanding the nature of science of teachers who experienced open inquiry process.
9. Raaya Israeli (2014) - The effect of system thinking on students' comprehension of the biological fundamental principle - homeostasis.
10. Odelya Hazut (2016) - Contribution of metacognitive awareness and collaborative learning to dynamic inquiry performances and student- teacher interactions as they reflected within on line forums.
11. Amos Gueta (2017) - Contribution of metacognitive support and collaborative learning to students' inquiry performances within open inquiry-based learning.
12. Shifa Wated (2017) -The contribution of the 'Intergenerational sustainability leadership' project to the development of environmental literacy of the community.
13. Hagit Isaschar (2018) - Attitudes of high school students who had experienced guided inquiry learning in comparison to students who had experienced the open inquiry learning regarding the nature of science and nature of inquiry process upon graduation and over time as adults.
14. Liron Schwartz (2018) - The Effect of Metacognitive Guidance and Collaborative Learning on a Motivational Dialog between Teacher and Student during Environmental.
15. Galit Karadi (2018) - Characterization Types of Transitions Between Stages of Open Inquiry Process 'Bioinquiry' and the Causes of Logical Connection Patterns in that Transitions.

Being supervised today:

16. Liel Rot - The effect of metacognitive instruction and collaborative learning on dynamic inquiry performance and metacognitive awareness expressed in hybrid discourse.

17. Itamar Hameeri – The Contribution of Metacognitive Support and Collaborative Learning to Students' Dynamic Inquiry Performances.
18. Moran Shetal - The contribution of combined Health related Physical Fitness Knowledge (HPFK) training with physical education classes to the physical literacy of middle-aged girls.

Ph.D Students:

In the past:

1. Tova Michalsky (2004) - The Effects of metacognitive guidance within asynchronous learning networks on inquiry learning processes (together with Prof. Zemira Mevarech).
2. Irit Sadeh (2008) - Development of basic and dynamic inquiry skills, and knowledge types, during open-inquiry learning in comparison to guided-inquiry learning.
3. Dorit Bar (2008) - Influence of teaching that integrates dynamic or static visual models on the development of an understanding of the transformation levels in the subject of "Synthetic Polymers".
4. Sara Klein (2008) - Characterization of the comprehension of the biological fundamental principle 'homeostasis', learned explicitly with computerized tools.
5. Idit Adler – (2015) - Developing metacognitive awareness and environmental literacy through metacognitive instruction embedded within collaborative inquiry learning (together with Prof. Zemira Mevarech).
6. Michal Nisim (2016) - The effects of aquatic activities during early childhood on sensory-motor, language and perceptual development compared to motoric activities in land (together with Prof. Zemira Mevarech).
7. Moria Mor (2016) - The impact of metacognitive instruction and explicit system thinking teaching on understanding the biological fundamental principle - homeostasis.
8. Pirchi Waxsman (2017) - The correlation between eye movements and cognition in graph comprehension.
9. Hagit Cohen (2018) - The effect of metacognitive awareness and media literacy on the development of drinking oriented nutritional health literacy.
10. Tal Berger (2018) - Learning in a 1:1 classroom with personal laptops - its unique features and effect on students' attitudes, abilities, acquisition of 21st century skills and comparison to different models of computing (together with Dr. Ornit Spektor-Levy).

Being supervised today

11. Sigalit Ortal Ivri - The relationship between Self Regulated Learning (SRL) and the promotion of environmental literacy as part of the training of a green leadership group.

Post-Doctorates:

1. Dr. Michaela Slezak
2. Dr. Ornit Spektor-Levy
3. Dr. Noa Avriel Avni
4. Dr. Bat Shahar-Dorfman
5. Dr. Zohar Snapir
6. Dr. Dana Sachiani

LIST OF PUBLICATIONS

ARTICLES IN REFEREED JOURNALS

1. Bauskin, A. R., **Zion, M.**, Spzirer, J., Zpirer, C., Islam, M. Q., Levan, G., Klein, G., & Ben-Neriah, Y. (1989). Expression and chromosomal assignment of a novel protein tyrosine gene related to the insulin receptor family. *Hematol Bluttranfus, 32*, 453-460.

2. **Zion, M.**, Ben-Yehuda, D., Avraham, A., Cohen, O., Wetzler, M., Melloul, D., & Ben-Neriah, Y. (1994). Progressive *de novo* methylation at the *bcr/abl* locus in the course of chronic myelogenous leukemia. *Proc. Natl. Acad. Sci. USA, 91*, 10722-10726.

3. Ben-Yehuda, D., **Zion, M.**, Avraham, A., Krichevsky, S., & Ben-Neriah, Y. (1994). De-novo DNA methylation at the BCR-ABL locus in the course of CML – a possible marker for tumor progression. *Blood, 84*(10), A154-A154 Suppl.

4. Ben-Yehuda, D., Krichevsky, S., Rachmilewitz, E. A., Avraham, A., Palumbo, G. A., Frassoni, F., Sahar, D., Rosenbaum, H., Paltiel, O., **Zion, M**., & Ben-Neriah, Y. (1997). Molecular follow-up of disease progression and interferon therapy in chronic myelocytic leukemia. *Blood, 90*(12), 4918-4923.

5. Ben-Neriah, Y., **Zion, M**., Avraham, A., & Ben-Yehuda, D. (15/3/94). Patent Application. Assay for monitoring the progress of CML. Yissum Research Development Company of the Hebrew University, Jerusalem. No. 108978.

6. **Zion, M.,** Shapira D., Slezak, M., Link, E., Bashan, N., Brumer, M., Orian, T., Nussinovitch, R., Agrest, B., & Mendelovici, R. (2004a). Biomind - A new biology curriculum that enables authentic inquiry learning. *Journal of Biological Education, 38*(2), 59-67.

7. **Zion, M.,** Slezak M., Shapira D., Link E., Bashan N., Brumer M., Orian T., Nussinovitch, R., Court D., Agrest B., Mendelovici R., & Valanides, N. (2004b). Dynamic, open inquiry in biology learning. *Science Education*, *88*, 728-753.

8. Shedletzky, E., & **Zion, M**. (2005). The essence of open-inquiry teaching. *Science Education International*, *16*(1), 23-38.

9. **Zion, M.**, & Stav, O. (2005). The living museum – developing students' appreciation for a nature site and promoting their environmental awareness. *School Science Review*, *86*, 317-324.

10. **Zion, M.,** Michalsky, T., & Mevarech, Z. R. (2005). The effects of metacognitive instruction embedded within an asynchronous learning network on scientific inquiry skills. *International Journal of Science Education, 27*(8), 959-983.

11. **Zion, M.**, & Slezak, M. (2005). It takes two to tango: In dynamic inquiry, the self-directed student acts in association with the facilitating teacher. *Teaching and Teacher Education, 21,* 875-894.

12. **Zion, M.**, Ventura, R., Yogev, H., & Stav, O. (2005). The effect of different experiences of environmental education on environmental literacy among junior high school students. *School Science Review, 87,* 53-58.

13. Spektor-Levy, O., Sonnenschein, M., & **Zion, M**. (2005). Technology integration in science studies - obstacles and incentives. *Science Education International, 18*(3), 211-224.

14. **Zion, M**, Guy, D., Yarom, R., & Slezak, M. (2006). UV radiation damage and bacterial DNA repair systems, *Journal of Biological Education, 41*(1), 30-33.

15. **Zion, M**., & Shedletzky, E. (2006). Overcoming the challenge of teaching open inquiry. *The Science Education Review, 5*(1), 8-10.

16. Michalsky, T., **Zion, M**., & Mevarech, Z. R. (2007). Developing students' metacognitive awareness in asynchronous learning networks in comparison to face-to-face discussion groups. *Journal of Educational Computing Research, 36*(4), 421-450.

17. **Zion, M.**, Cohen, S., & Amir, R. (2007). The spectrum of dynamic inquiry teaching practices. *Research in Science Education, 37(4),* 423-447**.**

18. **Zion, M.** (2008). On-line forums as a 'rescue net' in an open inquiry process. *International Journal of Science & Math Education, 6,* 351-375.

19. **Zion, M.** (2007). Implementation model of an open inquiry curriculum. *Science Education International, 18*(1), 93-112.

20. **Zion, M**., & Sadeh, I. (2007). Curiosity and open inquiry learning. *Journal of Biological Education, 41*(4), 162-168.

21. Mevarech, Z. R., **Zion, M.,** & Michalsky, T. (2007). Peer assisted learning via face-to-face or a-synchronic learning network embedded with or without metacognitive guidance: The effects on higher and lower achieving students. *Journal of Cognitive Education and Psychology (JCEP), 36(4),* 395-424.

22. Shamir, A., **Zion, M.,** & Spektor-Levy, O. (2008). Peer tutoring, metacognitive processes and multimedia problem-based learning: The effect of mediation training on critical thinking. *Journal of Science Education and Technology, 17,* 384-398.

23. Sadeh, I., & **Zion, M**. (2009). The development of dynamic inquiry performances within an open inquiry setting: A comparison to guided inquiry setting. *Journal of Research in Science Teaching, 46*(10), 1137-1160.

24. **Zion, M**., & Sadeh, I. (2010). Dynamic open inquiry performances of high-school biology students. *Eurasia Journal of Mathematics, Science & Technology, 6*(3), 199-214.

25. Avriel-Avni, N., Spektor-Levy, O., **Zion, M.,** & Rosalind-Levy, N. (2010). Children's sense of place in desert towns: a phenomenographic enquiry. *International Research in Geographical and Environmental Education, 19*(3), 241-259.

26. Avriel-Avni, N., **Zion, M.,** & Spektor-Levy, O. (2010). Developing a perception of a place as home in children, in a desert and isolated town. *Children, Youth and Environments, 20*(2), 116-149.

27. **Zion, M**., Spektor-Levy, O., Orchan, Y., Shwartz, A., Sadeh, I., & Kark, S. (2011). Tracking invasive birds - a challenge of open inquiry learning and conservation education. *Journal of Biological Education, 45*(1), 3-12.

28. Sadeh, I., & **Zion, M**. (2012). Which type of inquiry project do high school biology students prefer: Open or guided? *Research in Science Education, 42(*5), 831-848.

29. **Zion, M.,** & Mendelovici R. (2012). Moving from structured to open inquiry – Challenges and limits. *Science Education International*, *23*(4), 383-399.

30. Ram-Tsur, R., Nissim, M., **Zion, M**., Dotan Ben-Soussan T., & Mevarech, Z. R. (2013). Language development: The effects of aquatic and of on-land motor interventions. *Creative Education, 4*, 41-50.

31. **Zion, M.,** Schanin, I., & Rimerman-Shmueli, E. (2013). Teachers' performances during a practical dynamic open inquiry process. *Teachers and Teaching: Theory and Practice, 19*(6), 695-716.

32. Nissim, M., Ram-Tsur, R., **Zion, M.,** Mevarech Z. R., & Dotan Ben-Soussan T. (2014). Effects of Aquatic Motor Activities on Early Childhood Cognitive and Motor Development. *Open Journal of Social Sciences*, *2*, 24-39.

33. **Zion, M**., Adler, I., & Mevarech, Z. R. (2015). The effect of individual and social metacognitive instruction on students' metacognitive performances in an online inquiry discussion. *Journal of Educational Computing Research, 52*, 50-87.

34. Klein, S., & **Zion, M.** (2015). The characteristics of homeostasis – A new perspective on teaching a fundamental principle in biology. *School Science Review*, 97, 85-93.

35. **Zion, M.,** & Klein, S. (2015). A conceptual understanding of 'homeostasis' by studying its characteristics. *International Journal of Biology Education, 4*(1), 1-27.

36. Adler, I., **Zion, M**., & Mevarech, Z. R. (2016). The effect of explicit environmentally oriented metacognitive guidance and peer collaboration on students' expressions of environmental literacy. *Journal of Research in Science Teaching, 53*(4), 620-663.

37. Spektor-Levy, O., Aloni, O., & **Zion, M.** (2016). Mini science museum in school: development of scientific knowledge, positive attitudes towards science, and self-efficacy among the museum trustees. *International Journal of Environmental and Science Education, 11*(18), 11033-11059.

38. Berger Tikochinski, T., **Zion, M.,** & Spektor-Levy, O. (2016). Up and down: Trends in students' perceptions about learning in a 1:1 laptop model - A longitudinal study. *Interdisciplinary Journal of e-Skills and Lifelong Learning, 12,* 169-191.

39. Dorfman, B., Issachar, H., & **Zion, M.** (2017). Yesterday's students in today's world - Open and guided inquiry through the eyes of graduated high-school biology students. *Research in Science Education*. https://doi.org/10.1007/s11165-017-9683-6

40. Adler, I., Schwartz, L., Madjar, N., & **Zion, M.** (2018). Reading between the lines: Students' motivational expressions and teacher's motivational support in an online forum during open inquiry. *Science Education, 102,* 820-855.

41. **Zion, M.,** Schwartz, R. Adler, I. & Rimerman-Shmueli, E., (2018). An open-dynamic inquiry course enables in-service science teachers to present dynamic open performances and improve their NOS understanding. *Research in Science Education.*

42. Nissim, M., Ram Tsur, R., Glicksohn, J., **Zion, M**., Mevarech Z. R., Harpaz, Y., & Dotan Ben-Soussan, T. (2018). Effects of aquatic motor intervention on verbal working memory and brain activity. *Mind, Brain and Education*, 12(2) 90-99.

43. Adler, I., **Zion, M.** & Rimerman-Shmueli, E. (2019). Fostering Teachers' Reflections on the Dynamic Characteristics of Open Inquiry through Metacognitive Prompts. *Journal of Science Teacher Education,*
DOI: 10.1080/1046560X.2019.1627060

44. Mor, M. & **Zion, M.** (accepted for publication). Applying a system thinking learning approach to improve perception of homeostasis - a fundamental principle of biology. *Journal of Biological Education.*

ARTICLES IN REFEREED BOOKS

1. Avargil S., Spektor-Levy O., & **Zion M**. (2017). Developing science education research literacy among secondary in-service teachers. In: A. Sickel, & S. Witzig (Eds), Designing and Teaching the Secondary Science Methods Course: An International Perspective. Sense Publisher.

ACCEPTED FOR PUBLICATION

Papers resubmitted with major revisions

1. Adler, I., **Zion, M.,** & Rimerman-Shmueli, E. (resubmitted for publication). Fostering teachers' reflections on the dynamic characteristics of open inquiry through metacognitive prompts.

2. Schwartz, L., Adler I., Madjar N., **& Zion M.** (resubmitted for publication). The Effect of Metacognitive Support on Students' Expressions of Autonomy throughout an Open Inquiry Process.

Papers submitted for publication

1. Cohen, H. & **Zion, M**. (submitted for publication). Water is the taste of life – the contribution of metacognitive guidance to drinking-related nutritional literacy.

In preparation

1. Snapir, Z., Karadi G. & **Zion, M.** (in preparation). Characterizing the paths of logical associations between inquiry questions in an open inquiry process, and related inquiry skills and types of knowledge.
2. Watted, S. Klein S. & **Zion, M.** (in preparation). The impact of project of developing environmental literacy on intergenerational relationship in the community.

Refereed Learning Books

1. Kliachko, S., **Zion, M.** & Menis, J. (2014). *We have only one earth* - Five learning books intended for the use of high school students majoring in environmental science: Waste and recycling, Water, Air, Radiation and Noise, Environmental management. (Hebrew and Arabic).

Non-Refereed Publications

1. **Zion, M.** (1993). You are invited to present a poster at the Photosynthesis Conference. *The Biology Teachers' Journal*, *135*, 43-44 (Hebrew).

2. **Zion, M.** (1996). Calories aren't everything. *The Biology Teachers' Journal, 145*, 105-106 (Hebrew).

3. **Zion, M.** (1996). Control of gene expression – teaching emphasis. *The Biology Teachers' Journal, 148*, 48-52 (Hebrew).

4. **Zion, M.** (1998). About the AIDS virus – science news for the classroom. *The Biology Teachers' Journal, 155*, 75-80 (Hebrew).

5. **Zion, M.** (1999). Computer based activities for the biology class. *The Biology Teachers' Journal, 157*, 43-49 (Hebrew).

6. **Zion, M.** (1999). Inquiry – lab fun. *The Biology Teachers' Journal, 158*, 45-48 (Hebrew).

7. **Zion, M.,** Nosinowitz, R., & Eran-Zoren, Y. (1999). Humorous mistakes. *The Biology Teachers' Journal, 158*, 66-68 (Hebrew).

8. **Zion, M.,** & Yarom, R. (1999). DNA repair mechanism fights radiation damage. *The Biology Teachers' Journal, 159*, 47-53 (Hebrew).

9. **Zion, M.,** & Link, E. (2000). Lab activity for the next millennium. *The Biology Teachers' Journal, 161*, 30-32 (Hebrew).

10. **Zion, M**., & Atzmon, D. (2000). The robbed young bird, and his unlucky brother-an inquiry case study. *The Biology Teachers' Journal, 163*, 58-59 (Hebrew).

11. **Zion, M**., Fine, R. & Liron, O. (2000). Violence in nature. *The Biology Teachers' Journal, 163*, 76-81 (Hebrew).

12. **Zion, M**., Atzmon, D., & Link, E. (2003). *Homeostasis at the molecular level*. www.hs.ph.biu.ac.il, Bar-Ilan Univesity, Israel.

13. **Zion, M.** (2003). Living Museum - nature protection learning program. *The Biology Teachers' Journal, 167*, 64-69 (Hebrew).

14. **Zion, M.,** & Stav, O. (2003). The Genetic revolution. *The Biology Teachers' Journal, 168*, 19-22 (Hebrew).

15. **Zion, M.** (2003). Dynamic inquiry – process, reflection and the elements between them. *The Biology Teachers' Journal, 168*, 23-25 (Hebrew).

16. Agrest, B., Doldzanski-Etinger, F., Abulafia, N., Amir, R., Verthaimer, S., Eran-Zoran, Y., Frenkel, D., **Zion, M.**, Shiban, E., & Shimburski, G. (2004). *Syllabus of biological studies*. Jerusalem: The Israel Ministry of Education (Hebrew).

17. **Zion, M**., Atzmon, D., & Link, E. (2005). *Homeostasis in the human body*. www.hhs.ph.biu.ac.il, Bar-Ilan Univesity, Israel.

18. **Zion, M.,** Atzmon D., & Link, E. (2005). Nobel prize and homeostasis in the molecular level. *The Biology Teachers' Journal, 171*, 5-11 (Hebrew).

19. Sadeh, I., Spektor-Levy, O., & **Zion, M.** (2005). Invaders species: Enemies, lovers, or/and a challenge for inquiry and biodiversity learning *The Biology Teachers' Journal, 172*, 20-30 (Hebrew).

20. **Zion, M**., & Shedletzky, E. (2006). Overcoming the challenge of teaching open inquiry. *The Science Education Review, 5*(1), 8-10.

21. Atzmon D., Link, E.**,** & **Zion, M.** (2007). Glucose balance in the human body, and vaccination to type 1 diabetes. *The Biology Teachers' Journal, 175*, 34-38 (Hebrew).

22. **Zion, M**., & Sadeh, I. (2008). Curiosity and open inquiry learning. *The Biology Teachers' Journal, 177*, 7-17 (Hebrew).

23. Schanin, I., & **Zion, M.** (2011). Teachers experience dynamic open inquiry process., *181*, 1-13 (Hebrew).

24. **Zion, M.** (2012). Inquiry-based learning and teaching. Biology students' inquiry projects, Israel Ministry of Education, 5-18 (Hebrew).

25. Adler, I., **Zion, M**., & Mevarech, Z. R. (2016). The development of environmental literacy by peer collaboration. *The Junior-high school Teachers' Journal, 26-27*, 27-36 (Hebrew).

26. Adler, I., **Zion, M**., & Mevarech, Z. R. (2017). Metacognitive support embedded in Inquiry-based teaching, how and why? *The Junior-high school Teachers' Journal, 28-29*, 34-41 (Hebrew).

III. PAPERS PRESENTED AT SCIENTIFIC CONFERENCES

Articles Published in Refereed Conference Proceedings

1. **Zion, M**., Link, E., & Agrest, B. (2002). Dynamic inquiry-a recipe for a learning inquiry process full of surprises. The 13th Conference of the Israeli Educational Research Organization, October 2002, Bar-Ilan University, Ramat-Gan, Israel (Hebrew).

2. **Zion, M**., & Slezak, M. (2002). Dynamic inquiry provides teachers functioning as guides for autonomous learners. The 2nd International Conference on Science Education. November, 2002, Nicosia, Cyprus.

3. **Zion, M**. (2012). Teaching inquiry: A Nationwide Challenge for Both Teachers and Researchers. In J. Settlage & A. Johnston (Eds.), *Proceedings of the Science Education at the Crossroads Conference* (pp. 78-79). Providence, RI. Available online at http://www.sciedxroads.org/proceedings 2012.html.

4. Yarden, A. & **Zion, M.** (2016). Meaning of the term "research in didactics of biology". In Tal, T. and Yarden, A. (Eds.), *Proceedings of the 10th Conference of European Researchers in Didactics of Biology*, (197-202). Haifa, Israel.

Papers Presented at Scientific Conferences

1. **Zion, M**. (2003, March). Dynamic inquiry allows flexible and thought provoking inquiry learning. Paper presented at the NARST (National Association for Research in Science Teaching) Annual International Conference – "excellence in science teaching for all", Philadelphia, USA.

2. **Zion, M**. Michalsky, T & Mevarech, Z. (2003, August). The effects of metacognitive guidance within ALN (Asynchronous Learning Network) on the inquiry learning process (with). Paper presented at the ESERA (The European Science Education Research Association) Conference – "Research and the Quality of Science Education", Noordwijkerhout, The Netherlands.

3. **Zion, M**. Michalsky, T & Mevarech, Z. (2004, April). Developing scientific thinking and inquiry skills by solving problems within ALN discussion groups. Paper presented at the NARST (National Association for Research in Science Teaching) Annual International Conference -"excellence in science teaching for all", Vancouver, Canada.

4. Michalsky, T & Mevarech, Z. & **Zion, M**. (2004, July). Who benefits from metacognitive instruction and under what conditions? Paper presented at the first meeting of the EARLI (European Association for Research on Learning and Instruction) SIG (Special Interest group) on metacognition, University of Amsterdam, The Netherlands.

5. Mevarech, Z, Michalsky, T &. **Zion, M**. (2004, December). The effects of metacognitive instruction embedded within an asynchronous learning network on scientific inquiry skills. Paper presented at the international conference to review research on Science, Technology and Mathematics Education, UNESCO, Goa, India.

6. Mevarech, Z, Michalsky, T &. **Zion, M**. (2005, April). The roles of metacognitive instruction in developing students' science literacy under different learning environments. Paper presented at the AERA, Annual Meeting, Montréal.

7. **Zion, M**. Michalsky, T & Mevarech, Z. (2005, Nov.). The effects of metacognitive instruction embedded within an asynchronous learning network on inquiry and metacognitive skills. Paper presented at the WASEA – The Western Australian Science Education Association Annual Forum, Western Australia.

8. **Zion, M**., Cohen, S. & Amir, R. (2006, April). The dynamic inquiry teaching spectrum. (with S.). Paper presented at the NARST (National Association for Research in Science Teaching) Annual International Conference, San Francisco, USA.

9. **Zion, M**. (2007, August). Online forums scaffold students experiencing open and guided inquiry process. Paper presented at the ESERA (The European Science Education Research Association) International Conference, Malmö, Sweden.

10. Sadeh, I. & **Zion, M**. (2007, August). Development of dynamic inquiry skills during open-inquiry learning in comparison to guided-inquiry learning. Paper presented at the ESERA (The European Science Education Research Association) International Conference, Malmö, Sweden.

11. Sadeh, I. & **Zion, M**. (2008, Sep.). Development of dynamic inquiry skills during open-inquiry learning in comparison to guided-inquiry learning. Paper presented at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Utrecht University, the Netherlands.

12. Klein, S. & **Zion, M**. (2008, Sep.). Characterization of the comprehension of the biological fundamental principle 'homeostasis', learned explicitly with computerized tools. Paper presented at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Utrecht University, the Netherlands.

13. **Zion, M**., & Schanin, I. (2009, Sep.). Characterizing performances of teachers who had experienced a practical dynamic open inquiry process. Paper presented at the ESERA (The European Science Education Research Association) International Conference, Istanbul, Turkey.

14. **Zion, M**., & Sadeh, I. (2010, July). Open inquiry – performances and team spirit. Paper presented at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Braga, Portugal.

15. Adler, I., **Zion, M.** & Mevarech, (2013, April). Contribution of metacognitive instruction embedded within an open inquiry-based learning to metacognitive online discourse. Paper presented at the NARST (National Association for Research in Science Teaching) Annual International Conference, Puerto Rico.

16. Ram-Tsur, R., Nissim, M., Dotan Ben-Soussan, T. **Zion, M.** & Mevarech, Z. (2013, June). A comparison of the effects of aquatic and of on-land motor activities on motor and language development during early childhood. Paper presented at the Conference on Education and Evaluation (CEAE 2013). Beijing, China.

17. Nissim, M., Ram Tsur, R., **Zion, M.** & Z. Mevarech (2013, Sep.). The effects of aquatic motor activities on motor and language development during early childhood. Paper presentation. FENS Featured Regional Meeting. Prague, Czech Republic.

18. **Zion, M.,** & Yarden, A. (2014, July). Should biology be taught in high school? Implications for higher education and the Israeli society. Paper presented at the Ilanit International Conference of the Federation of the Israel Societies for Experimental Biology, Eilat, Israel.

19. Adler, I. **Zion, M.,** Mevarech, Z. & Sadeh, I. (2014, July). A Metacognitive-based Instructional Model Designed to Develop Environmental Literacy. Paper presented at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Haifa, Israel.

20. Mor, M., **Zion, M.,** Agrest, B. & Mendelovici, R. (2014, July). The impact of combination of metacognitive awareness instruction and system thinking. Paper presented at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Haifa, Israel.

21. **Zion, M.** (2014, July). Symposium 2: Special ERIDOB symposium: Current issues in biological education research at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Haifa, Israel. One of the discussants.

22. Adler, I. **Zion, M.,** Mevarech, Z. (2015, Feb.). Embedding meta-cognitive, support within inquiry-which kind, when and why? The Learning Sciences International Conference, Jerusalem, Israel.

23. Adler, I. **Zion, M.,** Mevarech, Z. (2015, March). The effect of individual and social metacognitive support on students' involvement in the inquiry process, as expressed by their online dynamic inquiry performances. The first international self-regulated learning (SRL) workshop, Bar Ilan, Israel.

24. Adler, I. **Zion, M.,** Mevarech, Z. (2015, August). The Effect of Metacognitive Support, Embedded within an Open Inquiry Process, on Students' Inquiry Outcomes, Evaluated by Students' Expression of NOS, Procedural Understanding and Scientific Practices. Paper presented at the ESERA (European Science Education Association) 11th Conference, Finland.

25. Berger Tikochinski, T., **Zion, M.,** & Spektor-Levy, O. (2015, july). Do Students Really Like to Learn in 1:1 Laptop Classes? Students' views and retrospective views of graduates. International Association for Cognitive Education and Psychology (IACEP). Harokopio University, Athens, Greece

26. **Zion, M.,** & Schwartz, R. (2015, August). Does a dynamic open inquiry course enable in-service science teachers to improve their Nature of Science understanding? Paper presented at the ESERA (European Science Education Association) 11th Conference, Finland.

27. Berger Tikochinski, T., **Zion, M.,** & Spektor-Levy, O. (2016, February). Up and down: Trends in students' perceptions about learning in a 1:1 laptop model- A longitudinal study. Paper presented at the 11th Chais Conference: Learning in the Technological Era: Study of Innovation and Learning Technologies, Open University, Raanana, Israel.

28. Cohen, H. & **Zion, M.** (2016, Sep.). A Metacognitive Guidance to Increase Drinking-Related Nutrition Literacy-DNL. Paper presented at the ERIDOB (European Researchers in Didactics of Biology) International Conference, Karlstad, Sweden.

29. Adler, I., **Zion, M.** Schwartz, L. & Madjar, N. (2017, April). Reading between the lines The effect of contextual factors on students' motivation throughout an open inquiry process. Paper presented at the NARST (National Association for Research in Science Teaching) Annual International Conference, Texas, USA.

30. Waxman P. T., Ram Tsur, R., & **Zion, M.** (2017, August). Paper presented at the ESERA (European Science Education Association) 12th Conference, Dublin, Ireland.

31. Berger Tikochinski, T., **Zion, M.,** & Spektor-Levy, O. (2018, March). Transformations in Students' Attitudes about Learning with Personal Laptops: During the Program and in Retrospect. Paper presented at the NARST (National Association for Research in Science Teaching) Annual International Conference, Atlanta, GA, USA.

32. Snapir, Z., Karadi, G., & **Zion, M**. (2018, October). Characterizing the paths of logical transitions between inquiry questions in an open inquiry process and their correlation with inquiry practices and types of knowledge. Paper presented at the EARLY SIG 20-26 Conference 'Argumentation and Inquiry as Venues for Civic Education', Jerusalem, Israel.

33. Schwartz, L, Adler, I., Madjar, N., & **Zion, M**. (2019, Jan.). The Correlation between Motivation Provided by the Teacher and Student Motivation throughout an Open Inquiry Process. The Learning Sciences International Conference, Technion, Israel.

34. **Zion, M**., Adler, I., & Rimerman-Shmueli, E. (2019, Aug). Metacognitive prompts facilitate teachers' reflections on dynamic open inquiry. Paper presented at the EARLI conference, Aachen, Germany.