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Academic Unit:

Faculty of Arts and Sciences
American University of Beirut

Department

Department of Education and
Science and Math Education Center

Rank:

Professor of Science Education

Education:

- Sept. 1988 * Doctor of Education in Curriculum and Instruction with emphasis in science education, research, and teacher training at the University of Cincinnati, Cincinnati, Ohio.
- May 1988 * Masters of Education, Curriculum and instruction with an emphasis on science education, University of Cincinnati, Ohio. Courses completed summer 1985, Thesis defended May 1988.
- June 1971 * Bachelor of Science in Biology/Chemistry (group major). American University of Beirut, Lebanon.

Experience:

- Sept. 2009 – Present * Director, Center For Teaching and Learning
* Director, Science And Math Education Center
- Oct. 2003 – Sept. 2009 * Chairperson, Department of Education, American University of Beirut, Beirut, Lebanon
- October 1994 – 2002 and 2001-03 * Director, Science and Math Education Center, American University of Beirut, Beirut, Lebanon
- 2003-present * Consultant, Dhofar University, Dhofar, Sultanate of Oman
- 2004-2007 * Consultant, Annibras School, Dubai
- 2000-2001 * Education Advisor, New School Program, Egypt. The New School Program is a research and development project in three Governorates in Egypt. The Program was funded by the USAID and managed by Education Development Center, Inc., Washington, DC.
- October 1993 – Present * Department of Education, Faculty of Arts and Sciences, American University of Beirut, Beirut, Lebanon. Responsibilities include teaching methods and research courses, supervising science student teachers, advising graduate and undergraduate students, supervising research of Masters students, and conducting and publishing research.
- September 1988-1991 and 1992-1993 * Assistant Professor of Science Education, Department of Science Teaching, Syracuse University, Syracuse, New York. Responsibilities include teaching curriculum, methods, and research

- courses, supervising science student teachers, advising graduate and undergraduate students, supervising research of doctoral students, and conducting and publishing research.
- 1991 – 1992 * Curriculum design Specialist, EDSP Project, Republic of Yemen. The Project was funded by USAID and managed By Education Development Center, INC., Washington, DC.
- 1975-1984 * Assistant Principal, St. Joseph School, Cornet Chahwan, Lebanon.
 * Chemistry Teacher Grades 11-13, St. Joseph School, Cornet Chahwan, Lebanon.
 * Human Biology teacher, Grade 13, St. Joseph School, Cornet Chahwan, Lebanon.
- 1971-1975 * General Science teacher, grades 7-10, St. Joseph School, Cornet Chahwan, Lebanon. Biology teacher, grades 10 & 13, St. Joseph School, Cornet Chahwan, Lebanon.
 * Chemistry teacher, grades 10-12, St. Joseph School, Cornet Chahwan, Lebanon.

Courses Taught

- Educ 255 * The Teaching of Science I
 Educ 256 * The Teaching of Science II
 Educ 263 * Practicum in Teaching Science in Secondary School
 Educ 273 * Science for Elementary Teachers I
 Educ 274 * Science for Elementary Teachers II
 Educ 305 * Foundations of Science Education
 Educ 306 * Recent Developments in Science Education

Service on Committees

Department committees

- * Curriculum and Examination Committee, Departmental committee, Chair
 * Practice Teaching Committee, Departmental committee, Chair

Faculty committees

- * Academic Committee, member
 * Advisory Committee, member
 * Faculty Teaching Effectiveness Committee, member
 * Graduate Program and Research Team of the FAS Strategic Plan, Chair
 * Admissions Committee

University committees

- * Accreditation Steering Committee, member
 * Accreditation Task Team on Educational Offerings, co-chair
 * Advisory Board of the Center for Teaching and Learning, chair.
 * Enrollment Management Committee, chair
 * Interfaculty Committee on the Environment, member
 * Task Force on Promotion Criteria and Procedures, member
 * Task Force on Undergraduate Teaching Excellence, secretary
 * Teaching Award Committee, University committee, member
 * University Learning Outcomes Coordinating Committee, chair

- * University Senate, member
- * University Teaching Effectiveness Committee, member

Professional Activities

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| 2009 | *Member of the ESERA 2009 Conference International Scientific Committee |
| 2009-present | *Member of the Editorial Board of the International Journal of Science and Math Education |
| 2008-Present | * Member of the Editorial Board of the Eurasia Journal of Physics and Chemistry Education. |
| May 2008 – Present | * Executive Committee member of the Supreme Education Council, State of Qatar. |
| 2008-present | * Member of the Editorial Board of International Journal of Environmental and Science Education (IJESE). |
| 2007-present | * Member of the Editorial Board of Educational Studies: Theory and Practice. |
| 2007- present | * Member of the editorial board of the International Journal of Excellence in Education. |
| 2005 – present | * Member of the editorial board of the Eurasia Journal of Math, Science, and Technology Education. |
| 2005-2007 | * Member of the editorial board of the Electronic Journal of Science Education |
| 2005-2006 | * Member of the advisory board of the Center for Applied Studies in Education (CASE) at Sharjah Women’s College |
| 2004-2007 | * Member of the executive board of the National Association for Research in Science Teaching (NARST), USA. |
| 2004-Present | * Consulting Editor for International Review of Education, Edited by the UNESCO Institute for Education, Hamburg, Germany |
| 2004-2008 | * International Coordinator and Chair of the International Committee, National Association for Research in Science Teaching (NARST), USA. |
| 1995-present | * Member of the Editorial Board of the Journal of Science Teacher Education. |
| 2003-present | * Contributing International Editor, Science Education, USA. |
| 2003-present | * Consulting Editor, African Journal of Educational Studies in Mathematics and Science. |
| 2003 – present | * Board of Governors, Brummana High School, Brummana, Lebanon. |
| 2003-Present | * Consultant and academic overseer to Dhofar University (Through an AUB Project) |
| 2003-2007 | * Consultant to Annibras International School, Dubai (Through an AUB Project) |
| 2001-present | * Member International Committee of the National Association for Research in Science Teaching. |
| 1996-Present | * Chair or Co-Chair of the Organizing Committee of The Science and Math Teachers’ Conference organized by the Science and Math Education Center, American University of Beirut. |
| 1995- present | * Reviewer for Journal of Science Teacher Education, Journal of Research in Science Teaching, School Science and Mathematics |

- Journal, Science Education, Electronic Journal of Science Education, Electronic Journal of Literacy Through Science, Acta Chimica Slovenica, and Science books and films.
- 1993-Present * Consultant for a number of Lebanese, Jordanian, Omani, Saudi, and Egyptian schools in science curriculum and teaching methodology.
- 1985-present * Member in the following associations in the USA: National Association for Research in Science Teaching, National Science Teachers Associations, School Science and Mathematics Association, Association for Science Teacher Education, and American Educational Research Association.
- 2003-Present * Member of the European Science Education Research Association.
- 2000-present * Member of the Lebanese Association for Educational Studies, Lebanon
- 2002 – 2004 * NARST Strand 8 (History, Philosophy, and Epistemology) Co-coordinator.
- 2000 – 2001 * Member of the scientific committee of First IOSTE Symposium in Southern Europe on Science and technology education: Preparing future citizens to be held in Paralimni, Cyprus, between April 18 and 21, 2001.
- 2000 – 2003 * Member of the NARST Outstanding Master’s Award Committee
* Member of the NARST Elections Committee
- 1999 – 2002 * Consultant for Kingdom Schools Project, Saudi Arabia, a Project managed by the American University of Beirut
- 1995 – 2000 * Editor, SMEC NEWSLETTER a publication of the Science and Math Education Center, American University of Beirut, Beirut, Lebanon.
- 1996 – 1998 * Member of the Higher Science Curriculum Committee and of the Chemistry and Scientific Literacy Committees
- 1995 – 2000 * Member of the Editorial Board of the Journal of Research in Science Teaching.
- 2001 – 2002 * Member of the Promotion Procedures Task Force, American University of Beirut
- 2001 – 2003 * Member of the Accreditation Task Force, American University of Beirut
- 2001 – 2004 * Co-coordinator of Teaching Effectiveness Initiative, American University of Beirut
- 2005 * Served as an examiner on the doctoral committee of Fadi El-Hage (Université St. Joseph, Lebanon and Univeristé de Montpellier, France).
* Served as an examiner on the doctoral committee of Khalid Khan, University of Science and Technology, Sana’a, Yemen.
* Served as an external examiner of the doctoral dissertation of Ahmad Al-Maashani (Cairo University).
- 2007 * Served as external examiner of the doctoral Dissertation of Layal Malkoun, Université de Lyon, France.
* Served as external examiner of the doctoral dissertation of Donna Lewis, Curtin University of Technology, Australia.

Honors

- Received the *Academy of Science for the Developing World-Arab Regional Office (TWAS_ARO)* regional Prize for the development of educational material and school science curricula, 2008.

Publications

Articles:

- Fowler, S., & BouJaoude, S. (1987). Using hierarchical concept / proposition maps to plan instruction that addresses existing and potential student misunderstandings in science. In Novak, J. (Ed.). *Proceedings of the Second International Seminar on Misconceptions and Educational Strategies in Science and Mathematics, Volume I* (pp. 182 - 186), Ithaca, NY: Cornell University, Department of Education.
- BouJaoude, S. (1989). *Problem solving in science*. Cincinnati: Science Education Faculty of the Department of Curriculum and Instruction, School of Education, University of Cincinnati¹.
- BouJaoude, S. (1991). A study of the nature of students' understandings about the concept of burning. *Journal of Research in Science Teaching*, 28, 689-704.
- BouJaoude, S. (1992). The relationship between students' learning strategies and the change in their misunderstandings during a high school chemistry course. *Journal of Research in Science Teaching*, 29, 687-699.
- BouJaoude, S. (1994b). Helping middle school pre-service teachers to address students' alternative conceptions. In L. Schafer (Ed.), *Behind the methods door: Educating elementary and middle school science teachers* (pp. 133-143). Columbus, OH: Association for the Education of Teachers in Science and ERIC Clearinghouse for Science and Mathematics.
- BouJaoude, S. & Giuliano, F. (1994). Relationships between achievement and selective variables in a chemistry course for nonmajors. *School Science and Mathematics Journal*, 96, 296-302.
- BouJaoude, S. (1995). *Environmental studies in the Lebanese curriculum* (PP. 49- 60). Capacity building and environmental development in Lebanon (Political & Civic Studies series, issue 1). Beirut: Fondation Rene Moawad & Friedrich-Naumann-Stiftung Foundation (in Arabic).
- BouJaoude, S. (1995, April). Making sense of the nature of science through physical science demonstrations. *The Science Teacher*, 46-49.
- Dagher, Z. & BouJaoude, S (1996). Tailoring science education graduate programs to the needs of all students (a commentary). *Science Education*, 80, 89-91.
- BouJaoude, S. (1996). Why an issue on science education? (Editorial). *SciQuest*, 6 (1), 4-5.
- Abd-El-Khalick, F. & BouJaoude, S. (1996). An exploratory study of the pedagogical content knowledge of science teachers. *Proceedings of the Oregon Academy of Science*, 32, 57-58.
- Abd-El Khalick, F. & BouJaoude, S. (1997). An exploratory study of the knowledge base for science teaching. *Journal of Research in Science Teaching*, 34, 673-699.
- Dagher, Z., & BouJaoude, S. (1997). Scientific views and religious beliefs of college students: the case of biological evolution. *Journal of Research in Science Teaching*, 34, 429-455.
- BouJaoude, S. (1997). *Contemporary conceptions of the philosophy of science, learning, and teaching and their implications for science education*. In The new trends and strategies in science education. Monograph published by the Lebanese Association for Education Studies. Beirut: Lebanon. (in Arabic).

¹This monograph is based on the Author's Masters Thesis presented to the Department of Curriculum and Instruction, College of Education, University of Cincinnati.

- BouJaoude, S. (1999). *Lebanese teachers and students' perceptions of the nature of science*. In Debs, M. (ED.). Proceedings of the Second Scientific Conference on the Future of Science and Mathematics teaching and the needs of the Arab society, Tunisia, Tunis, 19-22 December, 1996 (pp. 283-293). Beirut, Lebanon: Arab development Institute.
- BouJaoude, S. (1999). Environmental education in Lebanese schools, *SciQuest*, 7, 19-21.
- BouJaoude, S. (2000). *Trends in science teacher preparation*. In the Proceedings of the conference on Science Teaching: Content, Pedagogy, and Evaluation (L'enseignemnet des sciences: Contenu, didactique et evaluation) organized by the Center for Educational Research and Development and L'Institut Libanais d'Educateurs de l'Universite Saint Joseph (pp. 24-31). April 17-18, 2000.
- BouJaoude, S. & Sayah, F. (2000). *Teaching science in Arabic: Directions and future prospects*. In Language and Education in Lebanon, Edited by K. Shaaban and G. Ghaith (pp. 145-169). Beirut, Lebanon: The Lebanese Association for Educational Studies (In Arabic).
- BouJaoude, S. (2000). Conceptions of Science Teaching Revealed by Metaphors and by Answers to Open-Ended Questions. *The Journal of Science Teacher Education*, 11, 173-186.
- BouJaoude, S. (2000). What might happen if . . .?: Students use the futures wheel to analyze science-related social issues. *The Science Teacher*, 67, 45-47.
- BouJaoude, S. & Barakat, H. (2000). Secondary school students' difficulties in stoichiometry. *School Science Review*, 81, 91-98.
- BouJaoude, S. and Tamim, R. (2000) Analogies generated by middle-school science students: types and usefulness. *School Science Review*, 82(299), 57-63.
- BouJaoude, S. (2000). *Science teacher preparation in Lebanon: Reality and future directions* (pp. 45-74). In S. Abell (Ed.), Science teacher Education: An International Perspective. Dordrecht: Kluwer.
- BouJaoude, S. (2001). The Status of Elementary Science Education in Lebanon. *Science Education International*, 12, 7-9.
- BouJaoude, S. (2001). Conceptual Change in Two Middle School Science Students During Instruction about the Concept of Burning. *Journal of Educational and Psychological Sciences*, 2, 8-31.
- BouJaoude, S. (2001). *Developing science curricula to meet the challenges of the future*. In El-Komos et al. (Eds.) Proceedings of the symposium on new curriculum for a changing world (pp. 98-118). Manama: University of Bahrain, College of Education.
- BouJaoude, S. (2002). Balance of scientific literacy themes in science curricula: The Case of Lebanon. *International Journal of Science Education*, 24, 139-156.
- BouJaoude, S. (2002). *Developing basic and secondary education in the Arab world to encompass advances in science* (223-250). In A. Abulhaija (Ed.). Science and Technology in the Arab World. Amman: Shouman Association.
- Haidar, M., Abdel-Khalick, F., BouJaoude, S. (2003). Lebanese Secondary School Students' Environmental Knowledge and Attitudes. *Environmental Education Research*, 9, 21-33.
- BouJaoude, S. (2003). *Science and Technology in Schools of the Twenty-First Century*. In Jenkins, E. (ed.). Innovations in science and technology education, Volume VIII (pp. 43-68). Paris: UNESCO.²
- Abd-El-Khalick, F. & BouJaoude, S. (2003). Lebanese Students' Views of Nature of Science, *Mediterranean Journal of Educational Studies*, 8, 61-79.

² An abridged version of this article appeared in "Connect" (UNESCO International Science, Technology and Environmental Education Newsletter), VOL. XXVIII, No. 3-4, 2003.

- BouJaoude, S. (2003). *Scientific Literacy in the Lebanese curriculum*³. Proceedings of the conference “ 3e Millenaire: Quelle education pour quelle jeunesse (Third millennium: What education for what youth?). Kaslik, Lebanon: University of Holy Spirit, Kaslik. (A version of this paper appeared in the International Journal of Science Education, 24, 139-156.)
- BouJaoude, S. & Barakat, H. (2003). Students' Problem Solving Strategies in Stoichiometry and their Relationships to Conceptual Understanding and Learning Approaches. *Electronic Journal of Science Education*, 7, March 2003. <http://unr.edu/homepage/crowther/ejse/ejsev7n3.html>
- BouJaoude, S., Salloum, S., & Abd-El Khalick, F. (2004). Relationships Between Selective Cognitive Variables and Students' Ability to Solve Chemistry Problems. *International Journal of Science Education*, 26, 63-84.
- BouJaoude, S., & Abd-El-Khalick, F. (2004). *A Decade of Science Education Research in Lebanon (1992-2002): Trends and Issues in Mutua, K & Sunal, C. S. (Eds.) (203-241). Research on Education in Africa, the Caribbean, and the Middle East, Volume 1. Greenwich CT: Info Age Press.*
- Abd-El-Khalick, F., BouJaoude, S., Duschl, R. A., Hofstein, A., Lederman, N. G., Mamlok, R., Niaz, M., Treagust, D., & Tuan, H. (2004). Inquiry in Science Education: International Perspectives. *Science Education*, 88, 397-419.
- BouJaoude, S., & Youssef, R. (2004). The Effect of Teaching an Environmentally Oriented Science Unit on Students' Attitude and Achievement. *Science Education International*, 15, 63-78.
- BouJaoude, S. (2005). Using electronic and information technologies in science teacher preparation: The experience of a teacher educator. In W. Haddad (Ed.), *Technologies for education for all: Possibilities and prospects in the Arab region (23-28)*. Washington, DC.: Academy for Educational Development.
- Dagher, Z., & BouJaoude, S. (2005). Students' perceptions of the nature of evolutionary theory. *Science Education*, 89, 378-391.
- BouJaoude, S., Sowwan, S., & Abd-El-Khalick, F. (2005). *The effect of using drama in science teaching on students' conceptions of nature of science*. In Research and the Quality of Science Education, Boersma, K.; Goedhart, M.; de Jong, O.; Eijkelhof, H. (Eds.) (pp. 259-2670. Netherlands: Springer.
- BouJaoude, S. (2005). Improving Science Teaching Methodology at the University Level: Synchronizing the Teaching Approaches at the Secondary and University Levels. In UNESCO National Committee (Ed.), *Proceedings of the international conference on teaching science at the University level (112-130)*. Beirut, Lebanon: UNESCO National Committee.
- BouJaoude, S., & Ghaith, G. (2006). *Educational Reform at a Time of Change: The Case of Lebanon in Education Reconstruction in Transitional Societies*, in Ernest, J. & Treagust, D., (Eds.) (pp. 193-210). Netherlands: Sense Publishers.
- Ayoubi, Z. & BouJaoude, S. (2006). A Profile of Pre-College Chemistry Teaching in Beirut. *Eurasia Journal of Mathematics, Science and Technology Education*, 2 (3), 124-143. (Available at <http://www.ejmste.com>.)
- BouJaoude, S. & Santourian, G. (2007). Making the moment of inertia accessible to students. *School Science Review*, 88 (324), 21-25.
- BouJaoude, S. (2007). Enhancing Students' Ability to Learn Meaningfully in Science. *Melange: Revue Culturelle de Secrétariat General des Ecoles Catholique aux Liban*, 1 (May – June), 52-69.

³ A version of the paper appeared in English in the International Journal of Science Education

- BouJaoude, S. (2007). *Twenty-first century educational skills for development in the Mediterranean: Quality and curriculum relevance* (pp. 82-89). In Med. 2007: 2006 in the Euro-Mediterranean Space. Barcelona, Spain: European Institute of the Mediterranean (IEMed).
- Jurdak M., BouJaoude S. & Norma Ghumrawi N. (2007). Comparison of mathematization in microcomputer based laboratory (MBL) and verification – Type laboratory (VTL) in physics. In Pitta-Pantazi, P. & Philippou, G. (Editors), *Proceedings of the Fifth Congress of the European Society for Research in Mathematics Education*, pp. 2110-2119. Larnaka, Cyprus: European Society for Research in Mathematics Education and Department of Education, University of Cyprus.
- Salloum, S. & BouJaoude, S. (2008). Careful! It is H₂O: Teachers' Conceptions of Chemicals. *International Journal of Science Education*, 30, 221 – 238.
- Hokayem, H. & BouJaoude, S. (2008). College Students' Perception of the Theory of Evolution. *Journal of Research in Science Teaching*, 45, 395 – 419.
- Daoud, T. & BouJaoude, S. (2008). *The Effect of Vee Heuristic on Students' Meaningful Learning in Physics Grade 10 Laboratories in The Impact of the Laboratory and Technology on Learning and Teaching* (pp. 167-200). Charlotte, NC: Information Age Publishing.
- BouJaoude, S. & Tamim, R. (2008). Middle school students' perceptions of the instructional value of analogies, summaries and answering questions in life science. *The Science Educator*, 17, 72-82.
- BouJaoude, S. & Attieh, M. (2008). The Effect of using Concept Maps as Study Tools on Achievement in Chemistry. *Eurasia Journal of Mathematics, Science and Technology Education*, 4, 233-246.
- Jurdak, M. & BouJaoude, S. (2009). Country Case Study: Lebanon. In B. Vlaardingerbroek & N. Taylor (Eds.). *Secondary school external examination systems - reliability, robustness and resilience* (pp. 153-165). New York: Cambria Press.
- Yacoubian, H. & BouJaoude, S. (In Press). The effect of reflective discussions following inquiry-based laboratory activities on students' views of nature of science. *Journal of Research in Science Teaching*.
- BouJaoude, S. & Santourian, G. (In press). *The status of the nature of science in science education in Lebanon*. In Halai, N. and Iqbal, M. (editors). *Teaching and Learning Science in the Developing World*. Karachi. Pakistan: Agha Khan University.
- BouJaoude, S. & Al-Mouhayar (In press). *Teacher education in Lebanon: Trends and issues*. International Handbook on Teacher Education in K. Karras (Ed). Comparative Education Series edited by A. Kazamias- P. Calogiannakis- S. Bouzakis, Athens.
- BouJaoude, S. & Kamel, R. (In press). *Egyptian and Lebanese secondary school students' conceptions' of biological evolution and their relationships to religious beliefs*. Proceedings of the symposium on Islam and Evolution sponsored, McGill University, Canada, March 30 and 31, 2009.
- BouJaoude, S. & Jurdak, M. (in Press). Integrating physics and math through microcomputer-based laboratories (MBL): Effects on discourse type and quality and mathematization. *International Journal of Science and Mathematics Education*.

Books

- Ayoubi, Z. & BouJaoude, S. (2005). *Teaching science by inquiry*. Beirut, Lebanon: Lebanese Association for Education Studies (in Arabic).
- Xavier Roegiers, X., Gerard, F. M., BouJaoude, S. & Haidar, N. (In press). *A Dictionary of competencies: Trilingual Glossary of pedagogic terminology relating to the*

competency-based approach in the Lebanese educational system. Beirut, Lebanon: Center for Educational Research and Development (CERD)/Ministry of Education and Higher Education.

BouJaoude, S. & Dagher, Z. (Editors) (In press). *Science Education in the Arab States*. Rotterdam, The Netherlands: Sense Publishers.

The book includes the following chapters:

1. *Editor's Introduction* (Saouma BouJaoude, American University of Beirut, Beirut, Lebanon, and Zoubeida Dagher, University of Delaware, Newark, Delaware, USA.)
2. *Education in the Arab Region* (Munir Bashshur, American University of Beirut, Beirut, Lebanon)
3. *The Impact of Contextual Variables on Science Achievement in the Arab Countries: Results from TIMSS 2003*(Murad Jurdak, American University of Beirut, Beirut, Lebanon).
4. *Language of Instruction and Science Education in the Arab Region: Toward a Situated Research Agenda* (Tamer G. Amin, American University of Beirut, Beirut, Lebanon).
5. *Nature of Science Features in Curriculum Standards of Some Arab Countries* (Zoubeida R. Dagher, University of Delaware, Newark, Delaware, USA).
6. *Professional Growth through Engagement: Overcoming Bureaucratic and Personal Barriers Associated with Top-Down Models of Teacher Professional Development in Egypt* (Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign, Champaign, IL, USA).
7. *Role of an International Organization in Promoting Science Education in the Arab Region* (Ghada Gholam, UNESCO Cairo Office, Cairo, Egypt).
8. *Religion and Science Education in Egypt* (Nasser Mansour, School of Education and Lifelong Learning, University of Exeter, UK).
9. *Science Education Research in Lebanon: Trends and Issues* (Saouma BouJaoude, American University of Beirut, Beirut, Lebanon; Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign, Champaign, IL, USA, and Fadi El-Hage, Université Saint Joseph, Beirut, Lebanon).
10. *Status of Science Education in Jordan*(Sumaya AL- Muhtaseb, Amman Arab University For Graduate Studies Amman, Jordan and Mahmoud Alweher Hashemite University, Azarqa, Jordan).
11. *Science Education Development in the Sultanate of Oman* (Abdullah Ambusaidi and Ali Al-Shuaili, Sultan Qaboos University, Muscat, Oman).
12. *Outcome of a Half-Century of Science Education in North Africa: 1956-2006* (Fouad Chafiqi, Ecole Normale Supérieure Marrakech, Morocco and Andrée Tiberghien, UMR ICAR, CNRS-Université de Lyon, France).
13. *Reflections on Research in the Social Sciences in Arab States*, (Adnan El – Amine, American University of Beirut, Beirut, Lebanon).
14. *Towards productive research models in the Arab region* (Zoubeida Dagher, University of Delaware, Newark, Delaware, USA and Saouma BouJaoude, American University of Beirut, Beirut, Lebanon).

Textbooks

- October 1998 Consultant for: El-Khatib, F., Farah, E., Khishen, R. Kordab, E., & Zeitunlian, M. (1998). *Chemistry, Basic Education*, Grade 7. Dikwaneh, Lebanon: National Center for Educational Research and Development.
- October, 1998 Rifai, M., BouJaoude, S., El-Masri, M., & Nemra-Baydoun, G. (1999). *Chemistry, Secondary Education, Second Year, Humanities Section*. Dikwaneh, Lebanon: National Center for Educational Research and Development.

Reports

- BouJaoude, S. (2002). *The evaluation system of chemistry in the Lebanese curriculum and science at the elementary level in the Lebanese Curriculum*. Project funded by UNESCO and implemented by the Lebanese Association for Educational Studies. Beirut, Lebanon
- Billeh, V., BouJaoude, S., & Sulieman, S. (2002). *Regional synthesis on development of secondary education in the Arab States*. Report prepared for the International Conference on Secondary education for a better future: trends, challenges, and priorities. Muscat, Sultanate of Oman, December 21-23, 2002. Organized By UNESCO and the Ministry of Education, Sultanate of Oman.

- BouJaoude, S., & Al-Amin, A. (2003). *Co-primary investigator of the project to evaluate the Lebanese Curricula*. Project funded by UNESCO and implemented by the Lebanese Association for Educational Studies. Beirut, Lebanon.
- BouJaoude, S. (2003). *Achievement levels of new school project students in grades 1 to 5 in Arabic, math, and science*. Project funded by the Education Development Center Inc., Newton, MA, USA.
- BouJaoude, S. (2003). *Teaching and learning by inquiry: Role of the teacher and technology. Report prepared for the Regional Workshop on Evaluating Science and Technology Curricula*, UNESCO, Beirut (In Arabic).
- BouJaoude, S. (2003). *Status of science teaching in the Syrian Arab Republic*. Research funded by UNESCO Cairo Office.
- BouJaoude, S (2006). *Bridging the gap between scientists and science educators in the Arab Region*. Report presented at the Expert Group Meeting on “Bridging the Gap between Scientists and Science Educators”, organized and sponsored by the UNESCO Office, Cairo, Egypt, from January 29 – February 1, 2006. (An executive summary of this article appeared in a UNESCO Cairo Office document with the same title).
- BouJaoude, S. (2007). *Improving science education in the Arab States: lessons learned from education practices in four developed countries*. Report presented at the Expert Group Meeting organized and sponsored by the UNESCO Office, Cairo, Egypt on December 15, 2007 in Amman Jordan (With contributions from Dr. Zalpha Ayoubi, Lebanese University). Published in English and Arabic by UNESCO Cairo Office.
- BouJaoude, S. (2009). *Policy paper on improving quality of science education in the Arab Region*. Paper funded by UNESCO Cairo Office and The Arab League Educational, Cultural and Scientific Organization.

Book Reviews

- BouJaoude, S. **Review of the book:** Discovering by R. S. Root-Bernstein. School Science and Mathematics, 91, 226.
- BouJaoude, S. **Review of the book:** Gardner, Robert. Heavy-Duty Science Projects with Weight: How Much Does it Weigh? (Illus.; from the Sensational Science Experiments Series.) Springfield, NJ: Enslow, 2003. *Science Books and Films*, Volume 39 (4), July/August 2003.
- BouJaoude, S. **Review of the film:** Brandolini, Anita. Fizz, Bubble, & Flash! Element exploration & Atom adventures for hand-on science fun! (Illus. by Michael Kline; from the Williamson’s Kids Can Series.) Charlotte, VT: Williamson, 2003.
- BouJaoude, S.(2005). **Review of the book** “Wallace, Carolyn, Hand, Brian, and Prain, Vaughan --2004. Writing and Learning in the Science Classroom. Dordrecht: Kluwer Academic Publishers” *International Review of Education*, 51, 96–99.
- BouJaoude, S.(2005). **Review of the book** Kandasamy, Maheswar, and Lia Blaton (2004). School Principals: Core Actors in Educational Improvement – An Analysis of Seven Asian Countries. Paris: IIEP. *International Review of Education*, 51, 237-239.
- BouJaoude, S. (2005). Review of the book Mayring, Philip, and Christoph Von Rhoeneck (eds.). 2003. Learning Emotions: The Influence of Affective Factors on Classroom Learning. Frankfurt a. M.: Peter Lang. *International Review of Education*, 51, 349 – 372.

ERIC Documents

- BouJaoude, S. & Abdel-Khalick, F. (1996). *Lebanese middle school students' definitions of science and perceptions of its purpose and usage*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, Ca., April 22-25, 1995 (ERIC Document Reproduction Service No. ED 387328).
- BouJaoude, S. (1994a). *Students' systematic errors when solving kinetic and chemical equilibrium problems*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Atlanta, GA., April 15-19, 1993 (ERIC Document Reproduction Service No. ED 361 196).
- BouJaoude, S. (1996). *Epistemology and Sociology of Science according to Lebanese Educators and students*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, Ca., April 3-5. (ERIC Document Reproduction Service No. ED 394848).
- Abd-El-Khalick F, & BouJaoude, S. (1997). *An exploratory study of the disciplinary knowledge of science teachers*. I. P. Rubba, P. Keig, & J. Reys (Eds.), Proceedings of the 1997 Annual International Conference of the Association for the Education of Science Teachers (pp. 89-133). Pensacola, FL: Association for the Education of Teachers in science (ERIC Document Reproduction Service NO. ED 405 220).
- BouJaoude, S. & Tamim, R. (1998). *Analogies, Summaries, and Question Answering in Middle School Life Science: Effect on Achievement and Perceptions of Instructional Value*. Paper presented at the annual conference of the National Association for Research in Science Teaching, San Diego, California, April 19 -22, 1998 (ERIC Document Reproduction Service, ED 420503)

Abstracts in Conference proceedings:

- BouJaoude, S. (1987). Emerging trends from a decade of science education research, 1976-1986. *Science Education Information Report, abstracts of presented papers at the annual conference of the National Association of Research in Science Teaching* (P. 139). Columbus, OH: The ERIC Science, Mathematics, and Environmental Education Clearinghouse.
- BouJaoude, S. (1988). Identifying, categorizing, and correcting students' misconceptions about burning. *Science Education Information Report, abstracts of presented papers at the annual conference of the National Association of Research in Science Teaching* (P. 75). Columbus, OH: The ERIC Science, Mathematics, and Environmental Education Clearinghouse.

Research Grants

- BouJaoude, S. (2009). Received a 108,000 Euro grant to investigate Science and Society issues grant from European Commission in collaboration with Exeter University, UK. The grant will be inaugurated in January 2010.
- BouJaoude, S., & Jurdak, M. (2007) (Co-Principal Investigators). *From research to practice: making a difference in the classroom*, a three year (\$750,000.00) research grant in Lebanon, Jordan, and Saudi Arabia.
- BouJaoude, S. (2007) (Principal investigator in Lebanon). Theistic, Agnostic, and atheistic notions of biological evolution in Islamic societies: exploring Muslim teachers', students', and parents' understanding of evolution (\$6000.00). Research grant in collaboration with McGill University.
- BouJaoude, S. (2002-2007). Received a yearly grant of \$5000.00 to support the publication of Science and Math Education Conference Proceedings.

Presentations and Panels

- Nov. 2009 BouJaoude, S. (2009). *Lessons learned from a cross-cultural study on the theory of evolution*. Presentation at the International Conference on the Role of Higher Education in Fostering the Culture of Dialogue and Understanding. Notre Dame University, Louaize, Lebanon, Zouk Mosbeh, Lebanon, November 4-6, 2009.
- Nov. 2009 BouJaoude, S. (2009). *Science teaching as a conserving or as a subversive activity*. Presentation at the First Conference of the Lebanese Academy of Science on The sciences in Lebanon: Present challenges and future directions, Beirut, Lebanon, November 5-7, 2009.
- Oct. 2009 BouJaoude, S. and Akkary, R. (2009). Workshop on “Action Research for Teachers.”. Amman, Jordan, Annual conference of the Private Schools Council, October 24 and 24.
- Oct. 2009 BouJaoude (2009). Muslim Egyptian and Lebanese students’ conceptions of biological evolution. Paper presented at the symposium on Darwin and Evolution in the Muslim World. A conference at Hampshire College, Amherst, MA October 2–3, 2009
- Sept. 2009 BouJaoude et al. (2009). Biology professors’ and teachers’ positions regarding biological evolution and evolution education in a middle eastern society (co-authors Anila Asghar - The Johns Hopkins University, Jason R. Wiles - Syracuse University, Lama Z. Jaber - American University of Beirut, Diana A. Saredidine - American University of Beirut, and & Brian J. Alters - McGill University). Paper presented at the Biennial Conference of the European Science Education Research Association (ESERA), Istanbul, August 31 – September 5, 2009.
- Sept. 2009 Pongsophon , BouJaoude, & Yutakom (2009). *Global warming: Can it empty our rice bowl? Co-authors Pongprapan Pongsophon - Science Education, Department of Education, Kasetsart University, Bangkok, Thailand & Naruemon Yutakom - Science Education, Department of Education, Kasetsart University, Bangkok, Thailand).* Paper presented at the Biennial Conference of the European Science Education Research Association (ESERA), Istanbul, August 31 – September 5, 2009.
- Sept. 2009 Jaber, Halwany, Rizk & BouJaoude (2009). *Epistemological beliefs in science: An exploratory study of Lebanese university students’ epistemologies* (Co-authors, Lama Z. Jaber, Sarah A. Halwany, and Nadya G. Rizk - American University of Beirut). Paper presented at the Biennial Conference of the European Science Education Research Association (ESERA), Istanbul, August 31 – September 5, 2009.
- Sept. 2009 Erdogan, Ozel, BouJaoude, Prokop, Usak, Lamanauskas, & Tolli (2009). *A comparative study on university students’ attitudes toward a controversial issue: biotechnology* (Co-authors Mehmet Erdogan - Akdeniz University, Antalya, Turkey, Murat Ozel - Gazi University, Dep. of Elementary Education, Ankara, Turkey, Pavol Prokop - Trnava University, Department of Biology, Slovakia, Muhammet Usak - Dumlupınar University, Kütahya, Turkey, Vincentas Lamanauskas - Siauliai University, Siauliai, Lithuania, William W. Toili - Masinde Muliro University of Science and Technology, Kenya). Paper presented at the Biennial Conference of the European Science Education Research Association (ESERA), Istanbul, August 31 – September 5, 2009.

- Sept. 09 *Priorities in science education for today and tomorrow: international perspectives on critical issues.* Panel held at the Biennial Conference of the European Science Education Research Association (ESERA), Istanbul, August 31 – September 5, 2009. (Participants: Jane Butler Kahle (Miami University), Vincent Lunetta (Penn State University), Ed van den Berg (AMSTEL Institute University of Amsterdam), Mariona Espinet Blanch (Universitat Autònoma de Barcelona), Colette Murphy (School of Education Queen's University), M. Fatih Tasar (Gazi Universitesi, Gazi Egitim Fakultesi), Kenneth Tobin (The Graduate Center, City University of New York), Saouma B. BouJaoude (American University of Beirut))
- June 2009 BouJaoude, S. & El Hage, F. (2009). *Recherches en didactique des sciences au Liban (2002-2008): Tendances & Perspectives.* Carrefour D'échange, Faculté des Sciences de l'éducation, Beyrouth, Liban, 22 Juin 2009.
- June 2009 Teacher Education at the American University of Beirut: Transformation and dilemmas. Paper presented at the regional conference on teacher education at a crossroads organized by the Queen Rania Teacher Training Academy and Columbia University, Amman, Jordan, June 15-16, 2009.
- April 2009 BouJaoude, S. "Science education research in Lebanon (2003-2008): Trends and issues". Paper presented at the annual conference of the National Association for Research in Science Teaching (NARST) that will be held in Garden Grove, CA, April 17-21, 2009
- April 2009 Salloum, S., & BouJaoude, S. "American Muslim students perceptions of science and science learning: An exploratory study in a private Islamic school paper presented at the annual conference of the National Association for Research in Science Teaching (NARST) that will be held in Garden Grove, CA,
- March 2009 *Egyptian and Lebanese Secondary School Students' Conceptions' of Biological Evolution and their Relationships to Religious Beliefs.* Paper presented at the Symposium on Islam and Evolution, McGill University, Montreal, Canada, March 30 and 31, 2009.
- March 2009 *Role of curricula and teachers in preparing students for the 21st century.* Keynote address at the Symposium on Future Vision for School Curricula, organized by the College of Education, Sultan Qaboos University, Oman.
- Feb. 2009 Students, high school teachers, and university faculty conceptions of the theory of Evolution. Seminar organized by the Lebanese Association for Educational Studies, Beirut, Lebanon, February 21.
- Nov. School Based Reform (TAMAM Project). Presentation at the FIKR7 Conference organized by the Arab Thought Foundation, Cairo, Egypty, November 14.
- April 2008 Problem solving: A tool of transformation in science. A workshop presented at the Educational Symposium organized by orthodox schools, Beirut, April 17-18.
- April 2008 Project on School-based reform in Arab countries (TAMAM Project). Paper presented at the fifth Arab Education Forum, Sukhirat, Morocco, April 2-4, 2008.
- March 2008 BouJaoude S. & Jurdak, M. "Integrating physics and math through microcomputer-based labs (MBL): Effects on discourse type and quality and mathematization". Presented at the annual conference of the National

- Association for Research in Science Teaching (NARST), Baltimore, MD, March 30- April 2, 2008.
- March 2008 Salloum, S. & BouJaoude, S. "Classroom talk: Analysis of a science teacher balancing teaching to the test and for conceptual understandings" presented at the annual conference of NARST, Baltimore, March 30 - April 2, 2008.
- March 2008 Yacoubian, H. & BouJaoude, S. "The effect of reflective discussions following inquiry-based laboratory activities on students' views of nature of science" presented at the annual conference of NARST, Baltimore, March 30 - April 2, 2008.
- March 2008 BouJaoude and others. "Science education research traditions in Europe: Shedding light on didactics" symposium at the annual conference of NARST, Baltimore, March 30- April 2, 2008. I organized this seminar as a member of the NARST Committee on the History of Science Education.
- August 2007 BouJaoude, S., Jurdak, M., & Ghumrawi, N. (2007, August). *Discourse type and time use in microcomputer-based lab versus verification type lab in physics*. Paper accepted for publication at the biennial conference of the European Science Education Research Association (ESERA), Malmö University, Malmö Sweden.
- July 2007 Participated in the *World Conference on Science and Technology Education*, July 8-12, 2007, Perth, Australia and the UNESCO *International Science Education Policy Forum* (July 13, 2007), Perth, Australia by invitation from UNESCO.
- April 2007 *Learning before teaching*. Keynote speech at the Hariri Foundation Hariri High School II professional day, April 28, 2007
- April 2007 *Educational challenges and the preparation of teachers in the Arab states* (in Arabic). Paper presented at the Arab Education Forum, organized by the Arab Thought Foundation, Amman, Jordan, April 2007.
- April 2007 *College Students Perceptions of the Theory of Evolution* (Hayat Hokayem, AUB, Co-presenter). Paper presented at the annual conference of the National Association for Research in Science Teaching (NARST), New Orleans, April 15 – 18.
- April 2007 *University Science Educators: Are We Learning From Each Others' Experiences?* Paper presented as part of a seminar on "Professional Development of Science Educators Worldwide" (Justin Dillon, King's College, UK, Co-presenter) at the annual conference of the National Association for Research in Science Teaching (NARST), New Orleans, April 15 – 18.
- February 2007 Jurdak, M., BouJaoude, S., & Ghumrawi, N. (2007). *Comparison of mathematization in microcomputer based laboratory (MBL) and verification –type laboratory (VTL) in physics*. Paper presented at the Conference of the European Research in Mathematics Education (CERME), Larnaca, Cyprus, February 21-26, 2007.
- May 2006 *Chemistry teachers' practices in public and private schools in Beirut*. Paper presented at the Conference on Preparing Teachers for the Third Millennium, Al-Isra Private University, Amman, Jordan, May 18 and 19, 2006 (Co-presenter with Dr. Zalpha Ayoubi, Lebanese University).
- May 2006 *A theoretical model for the preparation of science teachers*. Paper presented at the Conference on Preparing Teachers for the Third

- Millennium, Al-Isra Private University, Amman, Jordan, May 18 and 19, 2006
- April 2006 *Relationship between students' views about knowing and learning physics and their understanding of physics* (Faten Masri is co-presenter) Paper presented at the annual conference of the National Association for Research in Science Teaching (NARST) (San Francisco, April 3 – 6, 2006).
- April 2006 Contributed to a seminar on “*Research Schools for Graduate Students: European and South African Models of Research Enculturation*” sponsored by the NARST International Committee at the annual conference of the National Association for Research in Science Teaching (NARST) (San Francisco, April 3 – 6, 2006).
- April 2006 Contributed to a seminar on “*European' and 'American' Perspectives on Research into Teaching and Learning*” Sponsored by the European Science Education Research Association (ESERA) and NARST International Committee at the annual conference of the National Association for Research in Science Teaching (NARST) (San Francisco, April 3 – 6, 2006).
- August 2005 *A decade of science education research in Lebanon (1992-2002)*. Trends and issues, paper presented as part of the NARST Sponsored Seminar at the 2005 European Science Educational Research Association (ESERA) conference, Barcelona, Spain (Co-presenter: F. Abd-El-Khalick)
- August 2005 *Teaching Authentic Science: Effect on Conceptual Change and Understanding the Nature of Science*. Paper presented at the 2005 European Science Educational Research Association (ESERA) conference, Barcelona, Spain.
- April 2005 *The role of the Lebanese press in enhancing scientific and technological literacy*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Dallas, Texas, April 3-7, 2005.
- April, 2005 Ho, H. H., He, M. F., Stacki, S. L., Swadener, E. B., Sunal, D. W., Sunal, C. S., Mutua, K., Stevens, D. D., Guven, I., Eilam, B., Dancy-Benjamin, G. V., Green, S. A., Kanga, A. W., Koutsoulis, M., Ganser, T., Abd-El-Khalick, F. S., BouJaoude, S. B., & Shen, Y. J.). *Research on education in Africa, the Caribbean, the Middle East, and the United States*. Interactive symposium conducted at the annual meeting of the American Educational Research Association, Montreal, Canada.
- April, 2005 Sunal, C. S., Mutua, K., Ganser, T., Abd-El-Khalick, F. S., BouJaoude, S. B., Guven, I., B., Koutsoulis, M., Stevens, D. D., & Swadener, E. B. *Through the eyes of the insider: Topics in research in Africa, the Caribbean and the Middle East*. Interactive symposium conducted at the annual meeting of the American Educational Research Association, Montreal, Canada
- January 2005 *Innovative methods for teaching science at the university level*. Workshop presented in Sana'a, Republic of Yemen between January 15 and 17, 2005. The workshop was sponsored by the UNESCO Cairo Office, National UNESCO Commission of Yemen, Islamic Educational, Scientific and Cultural Organization, and the University of Sana'a.
- Oct. 2004 *Improving science teaching methodology at the university level: Synchronizing the teaching approaches at the secondary and university levels*. Paper presented at the International Conference on Teaching at

- Universities: Present and future challenges (Theme 5 -- Policies and methodologies of teaching science within universities and the preparatory measures to that end at school level) organized by the Lebanese National Commission for UNESCO, Beirut, Lebanon, October 5-6.
- April 2004 *Lebanese Parents' Perceptions of Science and Science Teaching*. Paper presented at the annual conference of the National Association for Research in Science Teaching (NARST) (Vancouver, Canada, March 31-April 3, 2004) (Co-Presenter with Lina Hajj).
- April 2004 *Do Student Views of Nature of Science Influence Their Conceptual Understandings of Science Content?* (Co-Presenter with Dr. Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign). Presented at the annual conference of the National Association for Research in Science Teaching (NARST) (Vancouver, Canada, March 31-April 3, 2004).
- April 2004 *Science education in the Arab States: Current status and future directions*. Paper presented in the Symposium on International Science Education: Applications and Opportunities for Research, Scholarship, and Service during the annual conference of the National Association for Research in Science Teaching (NARST) (Vancouver, Canada, March 31-April 3, 2004)
- January 2004 *Application of New Information Technology in the Arab States to Achieve the Goals of Education for All presented in the Arab Regional Conference on Education for All (EFA) National Plans: What's Next* January 20-23, 2004.
- Dec. 2003 Presented a public lecture on Active Learning. Kingdom Schools, Saudi Arabia.
- August 2003 *The Effect of Using Drama in Science Teaching on Students' Conceptions of Nature of Science* (Suha Sowwan and Fouad Abd-El-Khalick, Co-presenters). Presented at the 2003 meeting of the European Science Education Research Association (ESERA), Nordwick, Netherlands, August 19-23, 2003.
- May 2003 *Teaching and learning by inquiry: Role of the teacher and technology*. Paper presented at the regional workshop on evaluating science and technology curricula, UNESCO, Beirut, May 20-22 (In Arabic).
- March 2003 *Careful! It is H₂O: Teachers' Conceptions of Chemicals* (Co-presenter: Sara Salloum). Paper presented at the annual conference of the National Association for Research in Science Teaching, Philadelphia, PA, March 23-26, 2003.
- March 2003 *The Effect of using Concept Maps as Study Tools on Achievement in Chemistry* (Co-presenter: May Atieh). Paper presented at the annual conference of the National Association for Research in Science Teaching, Philadelphia, PA, March 23-26, 2003.
- Nov. 2002 *Scientific literacy in the Lebanese curriculum*, Paper presented at the Conference on The Third Millennium: What education for What youths held at the University of the Holy Sprit, Kaslik, Lebanon. November 16, 2002.
- September 2002 *Lebanese middle school students' definitions of science and perceptions of its purpose and usage*. Paper presented at the Droshai Seminar on Science Learning in the Mediterranean by the University of Cyprus, Nicosia, Cyprus, September 11-15, 2002.

- April 2002 *Relationships between selective cognitive variables and students' ability to solve chemistry problems.* Paper presented at the annual conference of the National Association for Research in Science teaching, New Orleans, LA, April 6-10, 2002.
- April 2002 *Supply and demand of science teachers in the Arab States* (sponsored by ICASE and the NARST International Committee). Presented at the annual conference of the National Association for Research in Science teaching, New Orleans, LA, April 6-10, 2002.
- April 2002 *The New School Program: An educational Development activity.* Seminar presented at the Faculty of Health Science, American University of Beirut
- March 2002 *Using computers in the science laboratory.* Brummana High School, Brummana, Lebanon.
- January 2002 *Principles of teaching and learning.* Lecture presented at Saint Joseph School, Cornet Chahwan, January 11, 2002.
- Oct. 2001 *Developing basic and secondary education in the Arab world to incorporate innovations in science and technology.* Invited paper presented at the specialized Symposium on Science and technology in the Arab World: Present status and future prospects, organized by Shouman Foundation, Amman, Jordan, October 20 and 21, 2001.
- May 2001 *Developing science curricula to prepare students for the future.* Invited paper presented at the Symposium on curricula in the Arab World organized by the University of Bahrain, May 1-2, 2001.
- April 2001 *Lebanese Secondary School Students' Environmental Knowledge and Attitudes.* Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign; Maha Haidar-Makki, American University of Beirut; Saouma BouJaoude, American University of Beirut. Paper presented at the annual meeting of the American Educational Research Association, April 10 –14, Seattle, Washington
- March 2001 *The Use of Drama in Science Teaching: Its Influence on Students' Attitudes and Conceptions of Nature of Science* (Co-Presenter: Suha Sowwan). Paper presented at the annual conference of the National Association for Research in Science teaching, St. Louis, MI, March 25 – 28, 2001.
- March 2001 *Scientific inquiry in the Lebanese science curriculum* in the seminar on Inquiry in Science education: International perspectives (sponsored by ICASE and the NARST International Committee). Presented at the annual conference of the National Association for Research in Science teaching, St. Louis, MI, March 25 – 28, 2001.
- June 2000 *Science assessment framework in the new Lebanese Curriculum: Background, hurdles to implementation, and solutions.* Panel organized by the Faculty of Education, Lebanese University, Beirut, Lebanon.
- April 2000 *Students' and teachers' conceptions of chemicals.* Paper presented at the annual conference of the National Association for Research in Science teaching, New Orleans, LA, April 28-31, 2000.
- April 2000 *The Lebanese Science Curriculum as a vehicle to achieve scientific literacy for all.* Paper presented at the Symposium on Connecting communities through research in science and technology education for all organized by the International Committee of the National Association for Research in Science Teaching and ICASE, New Orleans, LA, April 28-31, 2000.

- April 2000 *Trends in science teacher education*. Keynote address in the Conference on teaching science: Content, methodologies, and evaluation. Universite Saint Joseph, Beirut, Lebanon.
- Sept. 1999 *Cooperative learning and the teaching of science*, Lecture presented at Antonin Sisters School, Khaldiyyeh, Zghorta, Lebanon.
- July 1999 Constructivism in science education and problem solving and creativity in teaching chemistry: Two Seminar Presented at the Department of Chemical Engineering, University of Rovira i Virgili, Tarragona Spain.
- April 1999 *Environmental knowledge: Transforming knowledge into action*. Paper presented at the sixth Annual Conference on Global Education: For a child-friendly school. Lebanese American University, Beirut, Lebanon.
- March 1999 *Students' problem solving strategies in stoichiometry and their relationships to conceptual understanding and learning approaches*. Paper presented at the annual conference of the National Association for Research in Science teaching, Boston, Massachusetts, March 28-31, 1999 (Hala Barakat Co-presenter)
- February 1999 Cooperative learning in teaching science. Lecture presented at Saint Joseph School, Cornet Chahwan, Lebanon.
- Nov. 1998 *Representation of scientific literacy themes in the Lebanese curriculum*. Paper presented at the Conference on Science, Technology, and Society organized by Center for Behavioral Research, American University of Beirut, Beirut, Lebanon, Nov. 26 -28, 1998
- Nov. 1998 *Introduction to constructivism and its implications to classroom practice with emphasis on the role of teachers and students in a constructivist classroom*. Workshop presented to IC teachers during a professional development day.
- July 1998 *Teaching critical thinking skills*. Lecture presented at the retreat of the AUB School of Nursing. Bois de Bologne, Lebanon
- June 1998 *Considerations necessary for implementing the New Lebanese Science curriculum*. Meeting with science coordinators and teachers in catholic schools in Lebanon organized by the General Secretariat of the Lebanese Catholic Schools. Beirut, June 24.
- June 1998 *Practice teaching as professional development*. Invited lecture delivered during the Professional Day for Cooperating Teachers organized by the Department of Education, American University of Beirut.
- April 1998 *Creativity in science teaching*. Invited lectures (two) at the annual meeting of the Private Schools Council, Amman, Jordan, April 29-30, 1998.
- April 1998 *Helping students confront difficulties with solving stoichiometry problems*. Paper Presented at the annual convention of the National Science Teachers Association, Las Vegas, Nevada, April 16-19, 1998 (Hala Barakat, Co-Presenter).
- April 1998 *Analogies, Summaries, and Question Answering in Middle School Life Science: Effect on Achievement and Perceptions of Instructional Value*. Paper presented at the annual conference of the National Association for Research in Science Teaching, San Diego, California, April 19 -22, 1998
- March 1998 New trends in teaching Chemistry at the pre-college level. Invited lecture presented at the meeting of the Syrian Chemical Association. March 28, 1998, Homs, Syria.

- February 1998 *New trends in teaching chemistry*. Lecture presented at the Symposium on the New Pre-College Chemistry Curricula organized by the Syndicate of Chemists in Lebanon, February 21, 1998. (In Arabic)
- February 1998 *Scope, sequence and coordination in the new Lebanese Science Curriculum*. Lecture presented at Saint Joseph School, Cornet Chahwan, Lebanon.
- January 1998 *Alternative concepts in science education and their remediation*. Lecture presented at the Department of Education, University of Balamand.
- September 1997 *Framework of the new Lebanese Science Curriculum*. Lecture presented at Jesus and Mary School, Rabweh, Lebanon
- June 1997 *Framework of the new Lebanese Science Curriculum*. Lecture presented at Hovakimian-Manoukian School, Sin-El-Fil.
- May 1997 *Framework of the new Lebanese chemistry curriculum*. Lecture presented at the First Science teachers Conference, American University of Beirut, Beirut, Lebanon, May 3.
- April 1997 *Contemporary conceptions of the philosophy of science, learning, and teaching and their impact on science education*. Paper presented at the seminar organized by the Lebanese Association for Education Studies, Beirut, Lebanon, April 11.
- March 1997 *Integrating environmental issues in the teaching of science*. Lecture presented at the Lebanese American University, March 10.
- March 1997 *College students' generic and specific conceptions of theories*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Chicago, IL, March 21-24, 1997.
- February 1997 *An overview of the New (Lebanese) Intermediate Science Curriculum*. Lecture presented at IC Middle School, Wednesday, Feb. 26, 1997.
- Dec. 1996 *Lebanese Teachers' and Students' Perceptions of the Nature of Science*. Paper presented at the Second Conference on the future of science and mathematics and the needs of the Arab Society, Tunis, Tunisia December 19-22, 1996.
- April 1996 *Encouraging students to think scientifically using hands-on activities*. Workshop conducted at the Annual meeting of the Private school Council, Amman, Jordan, April 18-19, 1996
- April 1996 *Epistemology and sociology of science according to Lebanese Educators and Students*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Saint Louis, Missouri, March 31- April 3, 1996.
- Oct. 1995 *Analysis of environmental issues in the teaching of science*. Presented in the workshop organized by the Green Forum for Lebanese elementary and middle school teachers. American University of Beirut Alumni Club, October 7, 1995.
- Oct. 1995 *Scientific views and religious beliefs of college students: The case of biological evolution*. Paper presented at the International History and Philosophy in Science Teaching Conference, Minneapolis, Minnesota, October 29-Nov. 2, 1995 (With Dr. Zoubeida Dagher).
- May 1995 *Constructivist teaching in science*. Lecture presented at the Antonin School in Zahle, Lebanon (With Dr. Zoubeida Dagher).
- April 1995 Presider in a session on *Informal Science Education* during the annual meeting of the National Association for Research in Science Teaching, San Francisco, CA, April 22-25, 1995.

- April 1994 *Position Paper on the Environment in Lebanon (Environmental Education Component)*. Regional Conference on the Environment: Jordanian University of Science and Technology, Irbid, Jordan, April 28- May 1, 1994.
- March 1994 *Making sense of the nature of science through demonstrations*. Paper presented at the annual Conference of the National Science Teachers Association, Anaheim, California, March 30 - April 2, 1994.
- March 1994 *Environmental Education in Lebanon*. Paper presented at the conference on Environmental problems at the national and the international levels organized by R. Mawad Foundation and Friedrich Newman Foundation. Carlton Hotel: Beirut Lebanon.
- Apr. 1993 *Education in the Republic of Yemen: present status and future prospects*. Paper presented at the conference of the Northeastern Educational Research Association, Portsmouth, NH April 1993.
- Apr. 1993 *Students systematic errors when solving kinetic and equilibrium problems*. Paper presented at the Annual Conference of the National Science Teachers Association, Atlanta, Georgia.
- June 1991 *New directions for science education*. Lecture presented at West Genesse School District, Syracuse, New York, June 24, 1991.
- May 1991 *Teaching and learning science in Lebanon: a presentation to honors students at Liverpool High School, Liverpool, New York, May 21, 1991*.
- Apr. 1991 *The relationship between students formal reasoning ability, prior knowledge, approaches to studying, and their performance in chemistry -- Part I*. Paper presented at the annual meeting of the New England Educational Research Organization Portsmouth, NH, April 24-26, 1991.
- Apr. 1991 *The relationship between students' formal reasoning ability, prior knowledge, approaches to studying, and their performance in chemistry -- Part II*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Fontanna, WI April 7-10, 1991.
- Mar. 1991 *Identifying high school students' erroneous problem solving strategies in chemistry*. Paper presented at the Annual conference of the National Science Teachers Association, Houston, Texas, March 27-30.
- Mar. 1991 *Similarities and differences between the science curriculum and teaching in Lebanon and the United States*. Lecture presented at Liverpool High School, Liverpool New York.
- Jan. 1991 *New initiatives in teacher education in the United States*: Panel member during the first meeting of the Syracuse University School of Education Forum on Teacher Education.
- Oct. 1990 *Careers in Chemistry Teaching*. Paper presented during the regional career day conducted by the American Chemical Society, Syracuse University, Syracuse, NY. Oct. 26, 1990.
- Apr. 1990 *Teaching for conceptual change*. Paper presented at the annual conference of the National Science Teachers Association, Atlanta, GA, April 5-8, 1990.
- Apr. 1990 *The relationship between high school students' learning style and their chemical misconceptions*. Paper presented at the annual conference of the National Association for Research in Science teaching, Atlanta, GA April 8-11, 1990.
- Mar. 1990 *Panel: the Teaching Assistant Program: the academic job hunt* with Dean Robert Jensen and Chuck Reutlinger, Personnel Office.

- May 1989 *The grant-in-aid program: an innovative program for training science teachers.* Paper presented at the regional conference of the Association for the Education of Teachers in Science Syracuse NY, May 5-6,1989.
- Mar. 1989 *A study of conceptual change in junior high school students during instruction about the concept of burning.* Paper presented at the annual conference of the National Association for Research in Science Teaching, San Francisco, California. Abstract Appeared in Science Education Information Report prepared by the ERIC Science and Mathematics Education Clearinghouse. Full document appeared as a Microfiche in ERIC.
- Apr. 1988 *Identifying, categorizing, and correcting students' misconceptions about burning.* Poster paper presented at the annual conference of the National Association for Research in Science Teaching, Lake of the Ozarks, Missouri. Abstract Appeared in Science Education Information Report prepared by the ERIC Science and Mathematics Education Clearinghouse.
- July 1987 *Developing a teacher training technique using concept maps.* Co-presenter of paper at the International Seminar on Misconceptions in Science and Mathematics, Cornell University, Ithaca, NY. The paper is published in the proceedings of the seminar.
- Apr. 1987 *Emerging trends from ten years of science education research, 1976-1986.* Paper presented at the annual conference of the National Association for Research in Science Teaching, Washington DC Abstract Appeared in Science Education Information Report prepared by the ERIC Science and Mathematics Education Clearinghouse.
- Apr. 1987 *Needs of Teachers regarding the teaching of science.* Paper presented at the National Convention of the National Science Teachers Association, Washington DC The paper was prepared and presented in collaboration with Dr. Glean Markle, Associate Dean, College of Education, University of Cincinnati and Dr. Robert Townsend, Science Supervisor, Cincinnati Public Schools.
- Mar. 1986 *Problem Solving for Secondary Science Teachers.* Paper presented at the National convention of the National Science Teachers Association, San Francisco.
- Apr. 1986 *Using hands-on activities in elementary science.* Co-presenter of workshop at the regional convention of the National Science Teachers Association, Indianapolis, Indiana.

Workshops

- Sept. 1993 Participated in the environmental education tour organized by the American University of Beirut to visit environmental education programs in institutions of higher learning and Government Agencies (EPA) in the United States.
- Oct. 1994 Participated in a workshop on environmental assessment organized by R. Mawad Foundation and Friedrich Newman Foundation. Ehden, Lebanon.
- Sept. 1995 Coordinated a three-day workshop entitled Environmental activities in science teaching at the Division of Education Programs, American University of Beirut.
- July 1996 Participated in two workshops at Duke University, Durham, North Carolina and the School of Environmental Science and Forestry at Syracuse, New York. The workshops focused on developing and

implementing environmental programs and activities at the K-12 levels.

- Sept. 1996 Coordinated a three-day workshop on Designing Science Laboratory Activities at the Division of Education Programs, American University of Beirut.
- Sept. 1997 Coordinated a three-day workshop on Misconception in Science at the Division of Education Programs, American University of Beirut.
- May 1997 Chairman of the Organizing Committee of the First Science and Math Teachers' Conference on The role of science and math teachers in developing and Implementing school curricula held on May 3, 1997 at the American University of Beirut and Editor of the Conference proceedings.
- Dec. 1999 Presented lectures in the Workshop for Science and Technology Supervisors on Environmental Education for secondary classes in the Arab World organized by the UNESCO Regional Office for Education to participate as a consultant in a training workshop for supervisors of science at the secondary level in the Arab countries. Muscat, Oman, December 12 - 17, 1998.
- July 1999 Participated in the activities of the Science Education for Public Understanding Project (SEPUP) National Fellows Conference that focused on the use of issue-oriented science education SEPUP materials. These programs included CHEM-2, SEPUP Modules, Issues, Evidence and You, Science and Sustainability, and Science and Life Issues. Also, participated in the SEPUP Leadership Institute whose purpose was to provide an intensive, interactive experience devoted to developing and enhancing participants' ability to act as consultants and leaders of professional development experiences for schools adopting SEPUP materials. The National fellows Conference and the Leadership Institute were part of the SEPUP Conference held between July 19 and July 23, 1999 at the Lawrence Hall of Science, University of California at Berkeley
- Jan. 2002 Workshop on Active learning in science at the elementary level. Egypt New School Program, Fayoum and Cairo, Egypt.
- June 2003 Coordinated and was a presenter in the Gulf Reform Project workshop held at AUB.
- Gave workshops and provided consultations for Al-Qualaa School, Sidon, Al-Manar School, Kobaih, Brummana High School, Brummana, Jesus and Mary School, Rabweh, North Lebanon College, Zghorta, Lebanon, Islamic Institute for Learning and Instruction, Tripoli, and Schools of Al-Beka's (in AUB Farm), Kingdom School, Saudi Arabia, Al-Maharat Schools, Saudi Arabia, News School program, Egypt.