

**Prof. Dr. Shu-Nu Chang Rundgren**  
Curriculum Vitae

Professor of Didactics and Science Education

Born in 1975

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**Current position**

**Professor of Didactics** (2015 – to date) & Scientific leader and coordinator for Educational Research in Citizenship Competences (ERiCC) research group (2017 – to date) at Department of Education at Stockholm University, Sweden

**Past positions**

**Professor II in Science Education** (2018 September to 2020 July)

Department of Primary and Secondary Teacher Education at Oslo Metropolitan University (OsloMet), Norway

**Professor of Science Education** (2011-2015)

Department of Engineering and Chemical Sciences at Karlstad University, Sweden.

**Academic Degrees**

**Associate Professor (Docent in Swedish) of Didactics** (2015)

Department of Education at Stockholm University, Sweden.

2000/09 – 2004/10	PhD, Graduate Institute of Science Education National Taiwan Normal University (Taipei, Taiwan, R.O.C.)
1997/09 – 1999/06	M.S., Institute of Genetics National Yang-Ming University (Taipei, Taiwan, R.O.C.)
1993/09 – 1997/06	B.S., Department of Nutrition and Food Science Fu-Jen University (Taipei, Taiwan, R.O.C.)

**Research Interests**

My research interests are around **competences for modern citizenship (CMC)**, in which

competence is defined as individuals who have knowledge, skill and attitude, and can further 'reflect and act' in various situations. The research focus of the CMC research for me includes **the aspects of teaching practices** (teachers' competences on developing students' CMC and the related teaching and assessment methods) **and learning environments** (students' CMC development through different teaching design, assessment strategies and formal/informal/non-formal learning contexts). To be more specific, there are four main areas of CMC developed in my research and they are

- (1) Critical thinking: teaching and learning about socioscientific issues (ex. climate change and vaccination issues) and argumentation skills through different learning settings.
- (2) Critical scientific media literacy: how science related information in mass media could be used in teaching and learning contexts in order to promote individuals' critical scientific media literacy
- (3) Competence on living safely and healthily: problematizing the lack of knowledge, attitude or skills in presuming safe and healthy life
- (4) Digital competence: how digital resources could be used in enhancing teaching and learning in formal and informal settings.

CMC is seen as the educational outcomes of my research and the journey can involve multi-resources of theoretical ideas (including both social and cognitive perspectives), design-based research and mixed methods approaches together with stakeholders from multi-disciplinary subject areas at all school levels in formal and informal learning settings as well as the public.

## **Publications**

### **Published papers in the refereed journals**

#### **\*Corresponding author**

54. **Chang Rundgren, S. N.\*** & Yamada, N. (In press). Does teaching training of ESD help in-service teachers to implement ESD in school? *Journal of Education for Sustainable Development*.
53. Chang Rundgren, S. N. (In press). Demonstrating didactic models for ESD and *Bildung* in school education. *Multidisciplinary Journal of School Education*.
52. Cebesoy, U.B. & **Chang Rundgren, S. N.\* (2023)**. Embracing socioscientific issues-based teaching and decision-making in teacher professional development. *Educational Review*, 75(3), 507-534. DOI: 10.1080/00131911.2021.1931037

51. Schreurs, Z., & **Chang Rundgren, S. N.\* (2023)**. Swedish and Dutch pre-service teachers' understandings of equity and preparedness to promote equity through their teaching. *Journal of Teacher Education and Educators*, 12(1), 75-93.
50. Hagerman, F., & **Chang Rundgren, S. N. \* (2022)**. A literature review on teaching ethical creativity in primary education. *Multidisciplinary Journal of School Education*, 11(22), 235-250.
49. Schreurs, Z., & **Chang Rundgren, S. N. (2021)**. Neighbourhood, segregation and school choice. *Multidisciplinary Journal of School Education*, 10(20), 111-133.
48. Kim, S.-K.\* , & **Chang Rundgren, S. N. (2021)**. South Korean elementary school teachers' experiences of inclusive education concerning students with a multicultural background. *International Journal of Inclusive Education*, 25(12), 1327-1341.
47. Aksland, C.\* & **Chang Rundgren, S. N. (2020)**. 5th–10th-Grade In-service Teachers' Pedagogical Content Knowledge (PCK) for Sustainable Development in Outdoor Environment. *Journal of Adventure Education and Outdoor Learning*, 20(3), 274-283.
46. Spiteri, M.\* & **Chang Rundgren, S. N. (2020)**. Literature Review on the Factors Affecting Primary Teachers' Use of Digital Technology. *Technology, Knowledge and Learning*, 25, 115-128. doi:10.1007/s10758-018-9376-x
45. **Chang Rundgren, S. N.\***, Sun, Y.-L. & Jidesjö, A. (2019). Examining gender differences in students' entrance into and persistence in STEM programs in Swedish higher education. *European Journal of Educational Sciences*, Vol. 6 (1).
44. Rundgren, C.-J., & **Chang Rundgren, S. N.\* (2018)**. Aiming for responsible and competent citizenship through teacher professional development on teaching socioscientific inquiry-based learning (SSIBL). *Asia-Pacific Forum on Science Learning and Teaching*, 19 (2), Article 2. [http://www.eduhk.hk/apfslt/v19\\_issue2/changsn/](http://www.eduhk.hk/apfslt/v19_issue2/changsn/)
43. **Chang Rundgren, S. N.\***, & Sun., Y.-L. (2018). A Systematic Review on Age 11-16 Ethnic Minority Students' Attitudes Toward Science and Aspirations for Science Careers. *European Journal of Educational Sciences*, Vol. 5 (4). doi: 10.19044/ejes.v5no4a1
42. Christenson, N.,\* Gericke, N., & **Chang Rundgren, S. N. (2017)**. Science and Language Teachers' Assessment of Upper Secondary Students' Socio-scientific Argumentation. *International Journal of Science and Mathematics Education*, 15, 1403-1422. doi: 10.1007/s10763-016-9746-6
41. Spiteri, M.\* & **Chang Rundgren, S. N. (2017)**. Maltese primary teachers' digital competence: Implications for continuing professional development. *European Journal of Teacher Education*, 40(4), 521-534. doi: 10.1080/02619768.2017.1342242

40. Bergqvist, A. & **Chang Rundgren, S. N.\* (2017)**. The influence of textbooks on teachers' knowledge of chemical bonding representations relative to students' difficulties understanding. *Research in Science and Technological Education*, 35(2), 215-237.
39. Rundgren, C.-J.\*, Ericsson, M., & **Chang Rundgren, S. N. (2017)**. Investigating the intertwinement of knowledge, value and experiences of upper secondary students' argumentation concerning socioscientific issues. *Science & Education*, 25(9), 1049-1071. doi: 10.1007/s11191-016-9859-x
38. **Chang Rundgren, S. N.\* & Rundgren, C.-J. (2017)**. What are we aiming for? – A Delphi study on the development of civic scientific literacy in Sweden. *Scandinavian Journal of Educational Research*, 61 (2), 224-239. doi: 10.1080/00313831.2015.1120231
37. Lunde, T.\*, Drechsler, M., & **Chang Rundgren, S. N. (2016)**. Exploring the negotiation of the meaning of laboratory work in a continuous professional development program for lower secondary teachers. *The Electronic Journal of Science Education*, 20(8), 28-48.
36. Bergqvist, A.\*, Drechsler, M., & **Chang Rundgren, S. N. (2016)**. Upper Secondary Teachers' Knowledge for Teaching Chemical Bonding Models. *International Journal of Science Education*. 38(2), 298-318. doi:10.1080/09500693.2015.1125034
35. Olsson, D.\*, Gericke N., & **Chang-Rundgren, S. N. (2016)**. The effect of implementation of education for sustainable development in Swedish compulsory schools – assessing pupils' sustainability consciousness. *Environmental Education Research*, 22(2), 176-202. doi:10.1080/13504622.2015.1005057
34. Belova, N., **Chang Rundgren, S. N.**, & Eilks, I.\* **(2015)**. Advertising and Science Education: A Multi-perspective Review of the Literature. *Studies in Science Education*, 51(2), 169-200. doi: 10.1080/03057267.2015.1049444
33. Chang Rundgren, S. N. **(2015)**. 'Is the moon more round in the Western world?' - Some important aspects of comparative education. *Culture Studies of Science Education*, 10(3), 707-718. DOI 10.1007/s11422-014-9635-7
32. **Chang Rundgren, S. N. \***, Nyberg, L., Evers, M., & Alexandersson, J. **(2015)**. Learning about flood risk: comparing the Web-based and physical flood-walk learning environment. *Asia-Pacific Forum on Science Learning and Teaching*, 16 (1), Article 12.
31. Christenson, N.\* & **Chang Rundgren, S. N. (2015)**. A framework for teachers' Assessment of socio-scientific argumentation: an example using the GMO issue. *Journal of Biological Education*, 49 (2), 204-212. doi: 10.1080/00219266.2014.923486
30. Walan, S & **Chang Rundgren, S. N.\* (2015)**. Student responses to context- and inquiry-based three-step teaching model. *Teaching Science*, 61 (2), 33-39.

29. Lunde, T.\*, Rundgren, C-J, & **Chang Rundgren, S. N. (2015)**. När läroplan och tradition möts – hur högstadielärare bemöter yttre förväntningar på undersökande arbete i naturämnesundervisningen. [When curricula and tradition meet – how lower secondary teachers encounter external expectations on inquiry-based science teaching]. *NorDiNa (Nordic Studies in Science Education)*, 11(1), 88-101.
28. **Chang Rundgren, S. N.\* & Yao, B.-J. (2014)**. Visualization in research and science teachers' professional development. *Asia-Pacific Forum on Science Learning and Teaching*, 15 (2), Article 2.
27. Berglund, T.\*, Gericke, N., & **Chang Rundgren, S. N. (2014)**. The Implementation of Education for Sustainable Development in Sweden: Investigating the Sustainability Consciousness among Upper Secondary Students. *Research in Science & Technological Education*, 32(3), 318-339. DOI: 10.1080/02635143.2014.944493
26. Christenson, N.\*, **Chang Rundgren, S. N. & Zeidler, D. (2014)**. The Relationship of Discipline Background to Upper Secondary Students' Argumentation on Socioscientific Issues. *Research in Science Education*, 44(4), 581-601.
25. Walan, S. & **Chang Rundgren, S. N.\* (2014)**. Investigating preschool and primary school teachers' self-efficacy and needs in teaching science: a pilot study. *Center for Educational Policy Studies (CEPS) Journal*, 4(1), 51-67.
24. Bergqvist, A.\*, Drechsler, M., de Jong, O. & **Chang Rundgren, S. N. (2013)**. Representations of chemical bonding models in school textbooks - help or hindrance for understanding? *Chemistry Education Research and Practice*, 14, 589-606.
23. Yao, B.-J.\* & **Chang Rundgren, S. N. (2013)**. The comparison of critical features identified between the still image and animation concerning the concept of transport through the cell membrane. *Bulletin of Biology*, 48(7), 6-10. (In Mandarin)
22. Rundgren, C.-J.\*, Hirsch, R, **Chang Rundgren, S. N. & Tibell, L. A. E. (2012)**. Students' Communicative Resources in Relation to their Conceptual Understanding – the role of non-conventionalized expressions in making sense of visualizations of protein function. *Research in Science Education*, 42(5), 891-913.
21. Rundgren, C-J, **Chang Rundgren, S. N.**, Tseng, Y-H., Lin, P-L. & Chang, C-Y\* **(2012)**. Are You SLiM? –The Development of an Instrument for Civic Scientific Literacy Measurement (SLiM) Based on Media Coverage. *Public Understanding of Science*, 21(6), 759-773.

20. Christenson, N., **Chang Rundgren, S. N.\*** & Höglund, H.-O. (2012). Using the SEE-SEP Model to Analyze Upper Secondary Students' Use of Supporting Reasons in Arguing Socioscientific Issues. *Journal of Science Education and Technology*, 21, 342-352.
19. Chang Rundgren, S. N. (2011). Post it! - A cross-disciplinary approach to teach socioscientific issues. *Teaching Science*, 5(3), 25-28.
18. Chang Rundgren, S. N. (2011). How does background affect attitudes to socioscientific issues in Taiwan? *Public Understanding of Science*, 20(6), 722-732. (NSC 94-2511-S-156-001-)
17. Rundgren, C. J., **Chang Rundgren, S. N.\*** & Schönborn, K. J. (2010). Students' conceptions of water transport. *Journal of Biological Education*, 44(3), 129-135.
16. **Chang Rundgren, S. N.\*** & Rundgren, C.-J. (2010). SEE-SEP: From a separate to a holistic view of socioscientific issues. *Asia-Pacific Forum on Science Learning and Teaching*, 11(1), Article 2.
15. Tseng, Y. H.\*, Chang, C. Y., **Chang Rundgren, S. N.** & Rundgren, C.-J. (2010). Mining concept maps from news stories for measuring civic scientific literacy in media. *Computers & Education*, 55, 165-177.
14. **Chang, S. N.\***, Yeung, Y. Y. & Cheng, M. H. (2009). Ninth graders' learning interests, life experiences and attitudes towards science & technology. *Journal of Science Education and Technology*, 18(5), 447-457.
13. Chang, S. N. (2008). The learning effect of modelling ability instruction. *Asia-Pacific Forum on Science Learning and Teaching*, 9(2), Article 3. (NSC 95-2511-S-156-001-MY2)
12. **Chang, S. N.\*** & Chiu, M. H. (2008). Lakatos' scientific research programmes as a framework for analysing informal argumentation about socioscientific issues. *International Journal of Science Education*, 30(13), 1753-1773. doi: [10.1080/09500690701534582](https://doi.org/10.1080/09500690701534582)
11. Chang, S. N. (2008). Using authentic assessment to investigate modeling ability. *Science Education Monthly*. 308, 2-6. (In Mandarin) (NSC 95-2511-S-156-001-MY2)
10. Chang, S. N. (2008). Investigating 9<sup>th</sup> graders' scientific literacy via authentic assessment. *Asia-Pacific Forum on Science Learning and Teaching*, 9(1), Article 15. (In Mandarin)
9. Chang, S. N. (2007). Implementing "Science Across the World" in a Resource-Based Learning Activity regarding Sustainable Development Issues. *Science Education International*, 18(4), 245-254.

8. Chang, S. N. (2007). Externalizing students' mental models through concept maps. *Journal of Biological Education*, 41 (3), 107-112.
7. Chang, S. N. (2007). Teaching argumentation through the visual models in a resource-based learning environment. *Asia-Pacific Forum on Science Learning and Teaching*, 8(1), Article 5.
6. Sie, Y.-L., Wang, T.-H., Chang, H.-P., **Chang, S. N.**, Shih, T. K.\* (2006). A SCORM-based caching strategy for supporting ubiquitous learning environment. *Lecture Notes in Computer Science (LNCS)*, 4158, 551-560.
5. Chang, S. N. (2005). The investigation of the current Taiwanese senior high school students' attitudes towards the vocation for science. *Taiwan Education Review*, 636, 33-37. (In Mandarin)
4. **Chang, S. N.** & Chiu, M. H.\* (2005). The development of authentic assessments to investigate ninth graders' scientific literacy: in the case of scientific cognition concerning the concepts of chemistry and physics. *International Journal of Science and Mathematics Education*, 3(1), 117-140.
3. Chang, S. N. (2004). To reflect educational learning via researches in cognitive science: In the case of reasoning. *Research and Development in Science Education Quarterly*, 34: 29-40. (In Mandarin)
2. Chang, S. N. (2003). Investigate creative problem solving from the cases of patents. *Business Education Quarterly*, 90: 48-52. (In Mandarin)
1. **Chang, S. N.**, Lin C. H., and Lin A.\* (2000). An acidic amino acid cluster regulates the nucleolar localization and ribosome assembly of human ribosomal protein L22. *FEBS Letters*, 484(1): 22-28.

### **Book Chapter**

1. Teräs, M.\*, **Chang Rundgren, S-N.**, Eliasson, E., & Ståhle, Y. (2020). Vocational teacher students' perceptions of 21st century skills in a vocational education programme in Sweden. In L. Moreno Herrera, M. Teräs, & P. Gougoulakis (Eds.), *Teaching, learning and teacher education: Emerging issues in research on vocational education & training vol. 5* (pp. 394-426).
2. Frerichs, N. & **Chang Rundgren, S. N.** (2019). Chapter 13. Science and the Media in a Digital Age. Ben Akpan (ed.), *Science Education: Visions of the Future*, pp.183-195. Next Generation Education, Abuja.

3. Spiteri, M.\* & **Chang Rundgren, S. N. (2018)**. Teachers' digital competence from a global perspective. In M. Attard & J. Madalinska-Michalak (eds.) *Teacher Education Policy and Practice - International Perspectives and Inspirations*, pp. 216-234. Key Concept Series. Foundation for the Development of the Education System, Polish National Agency for the Erasmus+ Programme. Warsaw.
4. **Chang Rundgren, S. N.\* & Rundgren, C.-J. (2015)**. Chapter 11. Making chemistry education relevant through mass media. In I. Eilks & A. Hofstein (eds.) *Relevant Chemistry Education – From Theory to Practice*, pp. 195-210. Rotterdam: Sense Publishers.
5. Rundgren, C.-J , Persson, T. & **Chang Rundgren, S. N.\* (2014)**. Comparing Different Stakeholders' View on Science Education with the Science Curriculum in Sweden: Reflecting on the PROFILES 3- step Module. In C. Bolte, J. Holbrook, R. Mamlok-Naaman, F. Rauch (Eds.) *Science Teachers' Continuous Professional Development in Europe. Case Studies from the PROFILES Project*, pp. 38-47. Alpen-Adria-Universität, Klagenfurt, Austria. ISBN: 978-3-9816683-0-8

### **Monographs**

- Chang, S. N. (2004). Investigating undergraduates' skills and models of argumentation from the perspective of epistemology. National Taiwan Normal University. (Unpublished PhD dissertation)
- Chang, S. N. (1999). The nucleolar transport signal (NOS) and ribosomal assembly of human ribosomal protein L22. National Yang Ming University. (Unpublished Master thesis)
- Chang, S. N. (1997). Will smoking cause the oxidation of low density lipoprotein (LDL)? Fu-Jen University. (Undergraduate research grant provided by National Science Council)

### **Translation work**

- Chang, S. N. (2003). Ch.9: The revolution of psychology. *Conceptual Revolutions* (Paul Thagard, 1992, Princeton: Princeton University Press). Hung-Yeh published, Taipei. (In Chinese)

### **Conference Papers & Papers in Published Proceedings**

#### **\*Corresponding author**

78. Chang Rundgren, S. N. (2023). Solutions for the challenges on ESD faced by school subject teacher. Oral presentation at NOFA conference, 8-11 May, Vaasa/Finland.



77. Hagerman, F.\* & **Chang Rundgren, S. N.** (2022). Teaching for Ethical Creativity – a Literature Review. ECER conference, 1-10 September (on-line).
76. Aksland, C.\* & **Chang Rundgren, S. N.** (2019). Aiming for sustainability – primary school teachers’ professional reflections on the teaching engagement with natural environments. Association for Teacher Education in Europe (ATEE), Aug. 13-16, Bath/UK.
75. Teräs, M.\*, Eliasson, E., **Chang Rundgren, S. N.**, & Ståhle, Y. (2019). Vocational teacher students and 21st century skills. Oral presentation at European Conference on Educational Research (ECER), September 3-6, Hamburg/Germany.
74. Teräs, M.\*, Eliasson, E., **Chang Rundgren, S. N.**, & Ståhle, Y. (2019). Vocational teachers’ perceptions on 21st century skills. Oral presentation at NordYrk, June 12-14, Helsinki/Finland.
73. Cebesoy, U. B.\* & **Chang Rundgren, S. N.** (2019). Investigating Turkish pre-service primary science teachers’ decision-making on controversial issues: The case of abortion. Oral presentation at Teacher Education Policy in Europe (TEPE), May 16-18, CraCow/Poland.
72. **Chang Rundgren, S. N.**\*, Eliasson, E., Ståle, Y., & Teräs, M. (2019). Exploring vocational teacher students’ perception on 21<sup>st</sup> Century skills learned from the educational program and applied in their teaching practices. Oral presentation at Teacher Education Policy in Europe (TEPE), May 16-18, CraCow/Poland.
71. **Chang Rundgren, S. N.**\* & Mwakabungu, F. B. (2018). Investigating knowledge and value aspects in relation to different subject areas via young fishers’ and school teachers’ responses on sustainable fishing in Tanzania. IOSTE conference, Aug. 13-17, Malmö University/Sweden.
70. Kim, S.-K.\* & **Chang Rundgren, S. N.** (2018). Teachers’ experience of inclusive education in primary schools: A systematic review. ICPQIE conference, June 18-19, Stockholm University/Sweden.
69. Mwakabungu, F. B., **Chang Rundgren, S. N.**\*, & Terräs, M. (2018). Bridging formal and informal learning – Investigating full-time and part-time young fishers and school teachers’ viewpoints concerning sustainable fishing. *Stockholm International Conference on Vocational Education and Training*, May 07-08, Stockholm/Sweden.

68. Chang Rundgren, S. N. (2018). The application of digital technology in higher education teaching practice and research. *Teacher Conference*, Feb. 08, Stockholm University/Sweden.
67. **Chang Rundgren, S. N.\*** & Rundgren, C.-J. (2018). High conference, but also high need! - Pre-service teachers professional development on teaching socioscientific inquiry based learning (SSIBL). *Teacher Conference*, Feb. 08, Stockholm University/Sweden.
66. **Chang Rundgren, S. N.\***, & Rundgren, C. J. (2017). Primary school pre-service teachers' confidence and need concerning socioscientific inquiry based learning. Poster presentation at ESERA conference, Aug. 21-25, Dublin/Ireland.
65. Rundgren, C. J., & **Chang Rundgren, S. N.\*** (2017). Primary teachers' reflections-in- and on- actions concerning socioscientific inquiry based learning activities. Poster presentation at ESERA conference, Aug. 21-25, Dublin/Ireland.
64. Rundgren, C.-J.,\* Eriksson, M., & **Chang Rundgren, S. N.** (2017). Investigating the intertwinement of knowledge, value, and experience of upper secondary students' argumentation concerning socioscientific issues. Oral presentation at ESERA conference, Aug. 21-25, Dublin/Ireland.
63. Lunde\* T., **Chang Rundgren, S. N.**, & Drechsler, M. (2017). How lower secondary teachers make sense of purposes of inquiry activities within a professional development programme. Oral presentation at ESERA conference, Aug. 21-25, Dublin/Ireland.
62. **Chang Rundgren, S. N.\*** & Rundgren, C-J (2016). Pre-service teachers' awareness on the teaching strategies involving socioscientific issues, inquiry-based science education to enhance socioscientific inquiry-based learning. ERIDOB conference, Sept 05-09, Karlstad/Sweden.
61. Rundgren, C-J\* & **Chang Rundgren, S. N.** (2016). The interrelationship of value and knowledge in students' socioscientific inquiry-based learning. ERIDOB conference, Sept 05-09, Karlstad/Sweden.
60. Christensson, N.\*, Gericke, N., & **Chang Rundgren, S. N.** (2015). Science and Swedish language teachers' assessment of upper secondary students' socioscientific argumentation. Oral presentation at Australasian Science Education Research Association (ASERA) conference. June 30-July 4, Perth/Australia.
59. **Chang Rundgren, S. N.\*** & Rundgren, C. J. (2015). Enhancing science teachers' professional knowledge on inquiry-based science teaching. Oral presentation at IOSTE conference, April 24-26, Istanbul/Turkey.

58. Rundgren, C. J. & **Chang Rundgren, S. N.\* (2014)**. The development of PROFILES teachers in Sweden. EcoBalt International conference. Oct. 08-10, Riga, Latvia.
57. Walan, S.\*, **Chang Rundgren, S.-N.**, & Mc Ewen, B. (2014). The indicators to evaluate teachers' professional development in context-based science teaching. Round table discussion at the meeting of the International Organization for Science and Technology Education (IOSTE), Sept. 21-27 in Sarawak, Borneo, Malaysia.
56. Gericke, N.\*, **Chang Rundgren, S. N.**, Berglund, T., & Olsson, D. (2014). The effect of ESD-schools on students' sustainability consciousness, Oral presentation within the symposia: The school as an agent in sustainable development. (Other participants: Anna Uitto & Seppo Saloranta. University of Helsinki, Finland, Jelle Boeve-de Pauw & Peter Van Petegem University Antwerp, Belgium) at the 42<sup>nd</sup> NERA (Nordic Education Research Association) Congress in Lillehammer, March 3 – March 7, Norway.
55. Lunde, T. & **Chang Rundgren, S. N.\* (2014)**. PROFILES: Developing a continuous professional development program to enhance inquiry-based science teaching. Poster presentation at the 2nd PROFILES conference. Aug. 25-27, Berlin/Germany.
54. Walan, S. & **Chang Rundgren, S. N.\* (2014)**. Students' responses to a PROFILES 3-step teaching module. Poster presentation at the 2nd PROFILES conference. Aug. 25-27, Berlin/Germany.
53. Chang Rundgren, S. N. (2014). The blossoms of PROFILES in Karlstad. Science fair presentation at the 2nd PROFILES conference. Aug. 25-27, Berlin/Germany.
52. **Chang Rundgren, S. N.\* & Rundgren, C.-J (2014)** SSI pedagogic discourse: embracing scientific media literacy and ESD to face the multimedia world. Oral presentation at the 22nd Symposium on Chemical and Science Education. June 19-21, Bremen/Germany.
51. Lunde, T.\*, **Chang Rundgren, S. N.** & Drechsler, M. (2014). Negotiating the meaning of laboratory work addressing inquiry-based science teaching. Oral presentation at NFSUN (Nordic Research Symposium on Science Education). June 04-06, Helsinki/Finland.
50. Walan, S.\*, & **Chang Rundgren, S. N.** & McEwen, B. (2014). Students' responses to an inquiry- and context-based science teaching module. Oral presentation at NFSUN (Nordic Research Symposium on Science Education). June 04-06, Helsinki/Finland.
49. Bergqvist, A.\* & **Chang Rundgren, S. N. (2014)**. The influence of textbooks on teachers' use and selection of chemical bonding models. Oral presentation at NFSUN (Nordic Research Symposium on Science Education). June 04-06, Helsinki/Finland.
48. Christenson, N.\*, Gericke, N. & **Chang Rundgren, S. N. (2014)**. A cross-disciplinary approach to teaching socioscientific issues – A study of the co-operation between language

- and science teachers teaching about global warming. Poster presentation at the 10<sup>th</sup> *ERIDOB* (European research in didactics of biology) conference. June 30 - July 4, Haifa/Israel.
47. Eriksson, M.\*, Rundgren, C.-J & **Chang Rundgren, S. N. (2013)**. Investigating the involvement of value and knowledge aspects in upper secondary students' socioscientific argumentations. Poster presented at the *ESERA* (European Science Education Research Association) conference. Sept. 2-7, Nicosia/Cyprus.
46. Lunde, T.\*, & Rundgren, C.-J. & **Chang Rundgren, S. N. (2013)**. Primary and lower secondary teachers' response of inquiry-based science teaching as characterized in a curriculum within a continuous professional development program. Poster presented at the *ESERA* (European Science Education Research Association) conference. Sept. 2-7, Nicosia/Cyprus.
45. **Chang Rundgren, S. N.\*** & Rundgren, C.-J. (2013). Science in media: An important aspect to be included to enhance civic scientific literacy. Paper presented at the *ESERA* (European Science Education Research Association) conference. Sept. 2-7, Nicosia/Cyprus.
44. Olsson, D.\*, Gericke, N., & **Chang Rundgren, S. N. (2013)**. Young peoples' integrated understanding of sustainable development. Poster presented at the *ESERA* (European Science Education Research Association) conference. Sept. 2-7, Nicosia/Cyprus.
43. Berglund, T.\*, Gericke, N., & **Chang Rundgren, S. N. (2013)**. Investigating Swedish upper secondary students' integrated understanding of sustainable development. Poster presented at the *ESERA* (European Science Education Research Association) conference. Sept. 2-7, Nicosia/Cyprus.
42. Christensen, N.\*, & **Chang Rundgren, S. N. (2013)**. Analyzing informal argumentation on socioscientific issues covering content and structure. Paper presented at the *ESERA* (European Science Education Research Association) conference. Sept. 2-7, Nicosia/Cyprus.
41. Walan, S.\* & **Chang Rundgren, S. N. (2013)**. When Pre- and In-service Science Teachers face Swedish New Curriculum at Pre-School Level. Poster presentation at *NOFA 4*, May 29-31, Trondheim, Norway.
40. Eriksson, M.\*, Rundgren, C.-J & Chang Rundgren, S. N. (2013). The fact-value intertwinement in Socio-scientific issues: A mixed-method approach to how upper secondary school students relate to values and knowledge in their informal argumentation. Poster presented at the 4<sup>th</sup> *NOFA* (Den fjerde nordiske fagdidaktikkonferansen) conference. May 29-31, Trondheim, Norway.
39. Nyberg, L., Evers, M. & **Chang Rundgren, S. N.\* (2013)**. The virtual flood walk – Applying the knowledge of risk for life-relevant problem-solving through a virtual environment. Oral presentation at *NOFA 4*, May 29-31, Trondheim, Norway.

38. Rundgren, C-J & **Chang Rundgren, S. N.\* (2012)**. A Delphi study in Sweden: probing different stakeholders' viewpoints on science education. Poster presentation presented at *PROFILES* conference, September 23-26, Berlin, Germany.
37. Lunde T. & **Chang Rundgren, S. N.\* (2012)**. Matching inquiry- and context-based science education to Swedish curricula. Poster presentation presented at *PROFILES* conference, September 23-26, Berlin, Germany.
36. Christenson, N.\* & **Chang Rundgren, S. N. (2012)**. Students study background and supporting reasons in arguing socio-scientific issues. Oral presentation at the 9<sup>th</sup> *ERIDOB* (European research in didactics of biology). September 18-22, Berlin, Germany.
35. **Chang Rundgren, S. N.\* & Rundgren, C.-J. (2012)**. Experience-based teaching and learning of socioscientific issues. Poster presentation at the 9<sup>th</sup> *ERIDOB* (European research in didactics of biology). September 18-22, Berlin, Germany.
34. Chang Rundgren, S. N. (2012). A holistic view of socioscientific issues: from teaching and evaluating perspectives. Oral presentation at *Oikos* conference. Jan. 31-Feb 02, Karlstad, Sweden.
33. **Chang Rundgren, S. N.\***, Christenson N. & Rundgren, C.-J. (2011). Analyzing students' use of reasons in arguing socioscientific issues through the SEE-SEP model. Oral presentation at *ESERA* conference. Sept. 5-9, Lyon, France.
32. **Chang Rundgren, S. N.\* & Gericke, N. (2011)**. Research in science education: A comparison between Sweden and Taiwan. Oral presentation at *NOFA 3*, May 11-13, Karlstad, Sweden.
31. Rundgren, C-J\*, **Chang Rundgren, S. N.**, Tseng, Y-H. & Chang, C.-Y. (2011). Difficult biological concepts in media coverage. Poster presentation at Annual Meeting of the National Association for Research in Science Teaching (*NARST*), April 3-6, Orlando, FL, USA.
30. Rundgren, C.-J.\*, Hirsch, R, Tibell, L. A. E. & **Chang Rundgren, S. N. (2010)**. Students' use of terms and conceptual understanding in making meaning of visualizations of protein function. Oral presentation at The 23<sup>rd</sup> Biennial Conference of the Asian Association for Biology Education (*AABE*). Oct. 18-20, Singapore.
29. **Chang Rundgren, S. N.\***, Rundgren, C.-J., Chang, C. Y. & Tseng, Y.-H. (2010). Cultural comparison of scientific literacy in media (SLiM) – From the perspective of biology subject. Oral presentation at The 23<sup>rd</sup> Biennial Conference of the Asian Association for Biology Education (*AABE*). Oct. 18-20, Singapore.

28. Christenson, N.\* & **Chang Rundgren, S. N. (2010)**. Investigating students' use of knowledge, value and personal experiences (KVP) in relation to the different attributes of socioscientific issues. Oral presentation at The 23<sup>rd</sup> Biennial Conference of the Asian Association for Biology Education (*AABE*). Oct. 18-20, Singapore.
27. **Chang Rundgren, S. N.\***, Rundgren, C.-J. & Chang, C. Y. (2010). Comparing Swedish senior high and undergraduate students' scientific literacy in media (SLiM) regarding biological terms. Oral presentation at *ICASE*. June 28-July 2, 2010. Tartu/Estonia.
26. Christenson, N., **Chang Rundgren, S. N.\*** & Höglund, H.-O. (2010). Upper secondary students' use of scientific knowledge in arguing socioscientific issues. Poster presentation at *ERIDOB*. June 13-17, Braga/Portugal.
25. **Chang Rundgren, S. N.\***, Rundgren, C.-J. & Chang, C. Y. (2010). Are you SLiM from a biological perspective? -- Evaluating scientific literacy in media regarding biological terms. Poster presentation at *ERIDOB*. June 13-17, Braga/Portugal.
24. Rundgren, C.-J.\*, Hirsch, R, Tibell, L. A. E. & **Chang Rundgren, S. N. (2010)**. Help-words -- A creative way of meaning-making via visualizing molecular life science by upper secondary and tertiary students. Oral presentation at *ERIDOB*. June 13-17, Braga/Portugal.
23. Chang Rundgren, S. N. (2009). What can socioscientific issues do in science education? Workshop held in the European Joint Meeting for Graduate Schools. Nov. 29 - Dec. 02, Rovaniemi/Finland.
22. Chang, S. N. (2009). Socioscientific issues – an important aspect of liberal education. Paper presented at Seminar of General Education and International Culture Studies, April 24, Taipei/Taiwan.
21. Chang, S. N. (2008). Informal argumentation and its relation to scientific literacy. Keynote speech at Annual meeting of Swedish National Graduate School in Science and Technology Education (FontD). Oct. 1-3, Malmö/Sweden.
20. Chang, S. N. (2008). Modeling non-science majors' modeling ability. Oral presentation at ASERA conference. July 2-5, Brisbane, Australia. (NSC 95-2511-S-156-001-MY2)
19. Chang, S. N. (2007). Investigating modeling ability through the authentic assessment. Oral presentation at the 23<sup>rd</sup> annual meeting of science education in Taiwan. Dec. 13-15, Kaohsiung/Taiwan. (NSC 95-2511-S-156-001-MY2)

18. Chang, S. N. (2007). The introduction and reflection of the research topics from four European countries. Paper presented at the 23<sup>rd</sup> annual meeting of science education in Taiwan. Dec. 13-15, Kaohsiung/Taiwan. (NSC 96-2517-S-156-001-)
17. Chang, S. N. (2007). SAW for non-science majors in Taiwan. Paper presented at the 11<sup>th</sup> Chinese Chemical Society Conference. Dec. 14-16, 2007, Hsinchu/Taiwan.
16. Chang, S. N. (2007). Different populations' informal argumentation regarding socioscientific issues. Paper presented at International Conference of ICASE. July 08-12, Perth/Australia. (NSC 94-2511-S-156-001-)
15. Oversby, J.\* & Chang, S. N. (2007). Mapping affect project (MAP): promoting judgment of learning and cognition in learning chemistry in Taiwan. Paper presented at International Conference of ICASE. July 08-12, Perth/Australia.
14. Chang, S. N. (2007). Promoting scientific literacy: from the perspectives of authentic assessment and the instruction of argumentation. Paper presented at Cross-Straits (Mainland-Taiwan-Macau-Hong Kong) Educational Conference on Enhancing teaching and Learning. May 25-26, Hong Kong.
13. Oversby J.\* & Chang S. N. (2007). How do we know if students are committed to learning chemistry? *Report of a symposium of Chemistry Teachers' Conference*, Finnish National Board of Education, March, Helsinki/Finland.
12. Oversby J.\* & Chang S. N. (2007). Self-Judging Learning and Improving Learning. Paper presented at ASE Annual Conference, January, Birmingham/UK.
11. Sie, Y. L., Wang, T. H., Chang, H. P., Chang, S. N., and Shih, T. K.\* (2006). A SCORM-based Caching Strategy for Supporting Ubiquitous Learning Environment. Paper presented at the 3rd International Conference on Autonomic and Trusted Computing (ATC-06), September 3-6, China.
10. Chang, S. N. (2006). An implementation of a "science across the world" learning activity. Presented in International Conference of Chemical Education (ICCE), Aug 12-17, Seoul/Korea.
9. Oversby, J.\* & Chang, S. N. (2006). Mapping Affect Project (MAP): Promoting links between values, judgment of learning and cognition in learning chemistry in Taiwan. Proceedings of XII International Organization for Science and Technology Education (IOSTE), July 30-Aug 4, Penang/Malaysia.

8. Chang, S. N. (2006). The visual model for constructing the argument regarding socioscientific issues in the resource-based learning environment. Proceedings of XII International Organization for Science and Technology Education (*IOSTE*), July 30-Aug 4, Penang/Malaysia.
7. Chang, S. N.\*, Wang, T. H., Chang, H. B. and Shih, T. K. (2006). Using SCORM-Based Learning Environment for Supporting Non-Science Majors' Science Learning. Proceedings of the 5th International Conference on Web-based Learning (*ICWL*), July 19-21, Penang/Malaysia.
6. Chang, S. N. (2006). Using informal argumentation to improve non-science majors' scientific literacy. Paper presented at the Symposium of Liberal Education and International Culture, April 22, Taipei/Taiwan. (In Mandarin)
5. Chang, S. N. (2006). The introduction of the models of informal argumentation. Paper presented at the Symposium of Liberal Education and International Culture, April 22, Taipei/Taiwan. (In Mandarin)
4. Chang, S. N. (2005). What are the differences between science and non-science major college students' informal argumentation through the lens of Lakatos's scientific programmes. Proceedings of the Biennial Meeting of the European Science Education Research Association (*ESERA*), Aug. 28-Sep.1, Barcelona/Spain.
3. Chang, S. N.\* & Chiu, M. H. (2005). Using Lakatos's scientific programmes to analyze informal argumentation regarding socioscientific issues. Paper presented at Annual Meeting of the National Association for Research in Science Teaching (*NARST*), April 4-7, Dallas/USA.
2. Chang, S. N.\* & Chiu, M. H. (2004). Probing students' conceptions concerning homeostasis of blood sugar via concept mapping. Proceedings of the Annual Meeting of the National Association for Research in Science Teaching (*NARST*), April 01-04, Vancouver/Canada.
1. Chang, S. N.\* & Chiu, M. H. (2003). Assessing Scientific Literacy via Context-based Test Items. Proceedings of the Annual Meeting of the National Association for Research in Science Teaching (*NARST*), March 23-26, Philadelphia/USA.

**Supervision in Sweden**

**Supervision completed**



**Post- Doctor:**

1. 2019-01-01 to 2019-10-31 Dr. Umran Betul Cebesoy, from Department of Elementary Science Education, Usak University /Turkey (Host by Stockholm University).
2. 2012-09-01 to 2013-08-31 Dr. Yao Bao-Jun, from Center of Teacher Education Research, Jiangxi Normal University/China (Host by Karlstad University).

**PhD student level:**

1. Mian supervisor for Fika B Mwakabungum, PhD thesis: Exploring young fishers' and teachers' knowledge and value aspects concerning the practice of fishing in the Rufiji Delta in Tanzania. Stockholm University, Sweden (2021-12-22)
2. Main supervisor for Caroline Ingell, PhD thesis: Exploring changes of conceptions, values and beliefs concerning the environment - A longitudinal study of upper secondary school students in business and economics education Stockholm University (2017-12-01).
3. Main supervisor for Anna Bergqvist, PhD thesis: Teaching and learning of chemical bonding models - Aspects of textbooks, students' understanding and teachers' professional knowledge. Karlstad University (2017-06-16).
4. Main supervisor for Nina Christenson, PhD thesis: Socioscientific argumentation: Aspects of content and structure. Karlstad University (2015-06-05).

**Licentiate student level:**

1. Co-supervisor for Teresa Berglund, Licentiate thesis: Student 'sustainability consciousness' and decision-making on sustainability dilemmas: Investigating effects of implementing education for sustainable development in Swedish upper secondary schools. Karlstad University (2014-11-28)
2. Co-supervisor for Daniel Olsson, Licentiate thesis: Young People's 'Sustainability Consciousness' - Effects of ESD Implementation in Swedish Schools. Karlstad University (2014-11-14)
3. Main supervisor for Torodd Lunde, Licentiate thesis: När läroplan och tradition möts - Om lärarfortbildning och undersökande aktivitetens syfte inom den laborativa NO-undervisningen i grundskolans senare del. Karlstad University (2014-09-19)
4. Main supervisor for Anna Bergqvist, Licentiate thesis: Models of chemical bonding: representations used in school textbooks and by teachers and their relation to students' difficulties in understanding. Karlstad University (2012-12-14)

5. Main supervisor for Nina Christenson, Licentiate thesis: Knowledge, value and personal experience: upper secondary students' resources of supporting reasons when arguing socioscientific issues. Karlstad University (2011-03-11)

**Master student level (from 2015):**

I was the main supervisor to the following master theses.

1. Narmin Abdurahmanova, thesis title: Parents' School Choice at the Primary Education Level in Azerbaijan - A Comparative Study Between Groups of Parents' Different Mother Languages of Azerbaijani and Russian. Accomplished in 2023 June.
2. Jing Jin, thesis title: Factors Influencing the Students' Decision-making on the Use of Evidence-based Medicine and Alternative Medicine - A Comparative Study between the First-year Science Students and First-year Non-science Students in Chinese Higher Education. Accomplished in 2023 June.
3. Osman Eman, thesis title: Grade 4-6 Teachers' Perceptions of Educational Technology Usage - A comparative case study of national and International Baccalaureate schools in Egypt Accomplished in 2022 June.
4. Yamada Naoya, thesis title: In-service Teachers' Understanding and Implementation of Education for Sustainable Development in Japan A Comparative Study between UNESCO's Associated Schools and Ordinary Schools. Accomplished in 2022 June.
5. Larsson, Wei Lu, Master Thesis: Investigating Chinese Upper Secondary School Students' Motivation for Learning English from the Aspects of Genders, Age and Majors. Accomplished in 2021 June.
6. Main supervisor for Jacobsdottir, Thorunn, Mater Thesis: Preschool Teachers' Pedagogical Content Knowledge on Education for Sustainable Development - A Comparative Study Based on Teaching Experience. Accomplished in 2021 June.
7. Main supervisor for Alkalaki, Eleni, Master Thesis: PEDAGOGICAL CONTENT KNOWLEDGE - A comparative study of Greek heritage language teachers in Sweden. Accomplished in 2021 June.
8. Main supervisor for Zoë Schreurs, Master Thesis: Achieving equity in compulsory education - A comparative study of Swedish and Dutch pre-service teachers' understandings of equity and preparedness to implement equity in teaching. Accomplished in 2020 August.
9. Main supervisor for Xiaoyu He, Master Thesis: National Curriculum and Global Citizenship - A quantitative curriculum analysis on four countries from primary level to upper secondary level in Sweden, Norway, Taiwan and South Korea. Accomplished in 2020 August.
10. Main supervisor for Xiojing Sun, Master Thesis: Skills Related to Social Competence in Swedish and Finnish National Curricula - A Longitudinal and Comparative Study of Six Skills in Curricula from Pre-school to Upper Secondary School Level. Accomplished in

2019 September.

11. Main supervisor for Zhimao Zhang, Master Thesis: Identity and Challenges of Swedish Language Teaching Profession in Sweden. Accomplished in 2019 June.
12. Main supervisor for Junjie Wei, Master Thesis: Comparing about student teachers' 21st Century skills learning in the teacher training program and application to teaching practice. Accomplished in 2019 June.
13. Main supervisor for Yu-ling Sun, Master thesis: Examining the gender difference in students' entrance and persistence in STEM programs in Swedish higher education - A comparative study through a quantitative secondary analysis. The Institution of International Education (IIE) at Stockholm University (2018-06-01).
14. Main supervisor for Soo-Kyung Kim, Master thesis: Inclusive Education for Students with a Multicultural Background – A comparative and qualitative approach investigating teachers' experiences in three primary schools with different school cultures in Dae-Gu City, South Korea. The Institution of International Education (IIE) at Stockholm University (2018-06-01).
15. Main supervisor for Carolina Carrasquilla, Master thesis: Students' perceptions on peace and war - A comparative case study between urban and rural 6 th to 11th graders within the post-conflict in Colombia. The Institution of International Education (IIE) at Stockholm University (2018-06-01).
16. Main supervisor for Hangi Chen, Master thesis: A Comparative Study on Swedish for Immigrants Courses and Folkuniversitetet's Swedish as Foreign Language Courses - Students' Reflections on Learning Experiences and Needs. The Institution of International Education (IIE) at Stockholm University (2017-05-29).
17. Main supervisor for Anudu Immaculata Chiamaka, Master thesis: Pre-school and Primary Teacher's Beliefs and Practices to Gender Stereotypes - A Comparative Study on Teacher's Gender and Regions in Nigeria. The Institution of International Education (IIE) at Stockholm University (2017-05-29).
18. Main supervisor for Baoxin He, Master thesis: Application of flipped classroom in junior high school in Shenzhen – a comparative case study between language and science classes. The Institution of International Education (IIE) at Stockholm University (2017-05-29).
19. Main supervisor for Marthese Spiteri, Master thesis: Research on teachers' digital competence: In the case of Maltese primary school teachers. The Institution of International Education (IIE) at Stockholm University (2015-05-22).
20. Main supervisor for Yumi Kaneko, Master thesis: A Case Study of Japanese and American Students: Experiences of Learning Different Culture from Each Other at

Cross-Cultural English Camp in Japan. The Institution of International Education (IIE) at Stockholm University (2015-05-22).

21. Main supervisor for Robert William Christensen, Master thesis: Comparing Study Abroad Programs at California Community Colleges. The Institution of International Education (IIE) at Stockholm University (2015-05-22).

### **Opponent and evaluation board (Betygsnämnden) for Licentiate and PhD theses:**

Opponent:

- Tormi Kotkas, PhD thesis: Designing, Implementing and Evaluating Teaching and Learning Modules for Promoting Decision-making towards STEM Careers, University of Tartu (2021-12-07).
- Jari Kukkonen, PhD thesis: Scaffolding of science inquiry learning: pupils' and teacher students' perpectives in adapting information and communication technology in education, University of Eastern Finland (2015-03-27).
- Ngo Vu Thu Hang, PhD thesis: Designing A Social Constructivism-Based Curriculum, For Primary Science Education In Confucian Heritage Culture. Freudenthal Institute for Science and Mathematics Education (FISME), Chemistry Education Group at Utrecht University in The Netherlands (2014-02-17).
- Miranda Rocksén, Licentiate thesis: Science enacted in everyday life: studies of on-line classroom practice, Göteborg University (2012-06-08).
- Karina Adbo, PhD thesis: Relationships between Models Used for Teaching Chemistry and Those Expressed by Students, Linnaeus University (2012-03-30).

Assessment board for PhD degree:

- Assessment board member for Catarina Wästerlid, Licentiate thesis. Malmö University (scheduled on 2022-06-01).
- Assessment board member for Chan Hon Yuen Barry, PhD thesis: A comparative study of the effectiveness of 'History of Science' approach and 'Socio-scientific Issue' approach in improving high school biology students' understanding of nature of science. The Education University of Hong Kong (2020-02-25).
- Assessment board member for Lau Chun Hung Barry, PhD thesis: Using Socio-scientific Issues to Promote Male Students' Metacognitive Regulation, Self-efficacy and Conceptual Understanding in learning Biology. The Education University of Hong Kong (2019-03-06).
- Assessment board member for Jörgen Holmberg, PhD thesis: Designing for added pedagogical value : A design-based research study of teachers' educational design with ICT. Stockholm University (2019-01-25)
- Assessment board member for Tho Siew Wei, PhD thesis: The effectiveness of remote-controlled laboratory system for science education. The Hong Kong Institute of Education, Hong Kong (2015-05-29).
- External pre-examiner for Tho Siew Wei, PhD thesis: The effectiveness of

remote-controlled laboratory system for science education.. The Hong Kong Institute of Education, Hong Kong (2015-04-30).

- External pre-examiner for Jari Kukkonen, PhD thesis: Scaffolding of science inquiry learning: pupils' and teacher students' perceptives in adapting information and communication technology in education, University of Eastern Finland (2014-06-09).
- Assessment board member for Jorryt van Bommel, PhD thesis: Improving teaching, improving learning, improving as a teacher: mathematical knowledge for teaching as an object of learning, Karlstad University in Sweden (2012-09-10).

Examiner for licentiate students at Karlstad University:

- Anna Morgren, licentiate thesis: School organization and ESD quality. Karlstad University (Aug. 2012 – to date).
- Karin Thörne, licentiate thesis: Teaching genetics – a linguistic challenge; A classroom study of secondary teachers' talk about genes, traits and proteins. Licentiate thesis, Karlstad University Press, Karlstad, Sweden (2012-12-07).

Examiner of Master thesis:

- An SIDA master program for Afghanistan students studying at Karlstad University in 2012.

## **Research Projects and Cooperation**

2014-2017

Promoting Attainment of Responsible Research and Innovation in Science Education (PARRISE) (**Working package leader and the principal investigator at KaU and SU**) (EU FP7 project no. 612438, Grant: 174,971euro/1,574,739 SEK)

2012-2014

Professional Reflection Oriented Focus on Inquiry-based Learning and Education through science (PROFILES) (**Principal investigator in Sweden**) (EU FP7 project no. 266589. Grant: 125,190euro/1,126,710 SEK)

2012-2015

Investigating the underlying factors contributing to schools' success in education for sustainable development (**Co-principal investigator**) (VR-2011-5897, Grant: 3,100,000 SEK)

2010 to 2011

Human body concept in early childhood education, with Prof. Lena Tibell and Dr. Ragnhild Löfgren at Linköping University (Sweden). (**Co-principal investigator**)

2009 to date

Science communication (SLiM) (NSC project), Prof. Chun-Yen Chang at National Taiwan Normal University (Taiwan) and Dr. Carl-Johan Rundgren at Stockholm University (Sweden). (**Co-principal investigator**)

2008 to 2010

Students' understanding of molecular life sciences, Prof. Lena Tibell and Dr. Carl-Johan Rundgren at Stockholm University (Sweden). (**Co-principal investigator**)

2007 to 2009

ROSE project with professors from Norway, Hong Kong and China. (**Principal investigator in Taiwan**)

2007 to 2008

Developing an interactive video game-based learning environment (**Co-principal investigator**) (NSC grant 96-2520-S-216-001- )

2006 to 2008

The development and implementation of modelling models in chemical education – Using cognitive apprenticeship to investigate the influence of modelling ability and process of

students' learning about "battery" in science (Aug .1st, 2006 ~ July 31st, 2008) (**Principal investigator**) (NSC grant 95-2511-S-156-001-MY2, Grant: NTD1,468,000)

2005 to 2006

Developing the assessment to evaluate the models of argumentation (Aug.1st, 2005 ~ July 31st, 2006) (**Principal investigator**) (NSC grant 94-2511-S-156-001-, Grant: NTD532,000)

2005 to 2007

Mapping Affect project with Prof. John Oversby at The University of Reading (UK). (**Principal investigator in Taiwan**)

2005 to 2007

SCORM-based e-learning environment with Prof. Timothy Shih at TKU (Taiwan) (**Co-principal investigator**)

### **Academic and Professional Experiences**

**Honorary Chair Professor - 2017 July. 01 to 2018 Dec. 31**

National Tsing Hua University in Taiwan, R. O.C.

**Senior Lecturer of Didactics - June 23, 2014 – Nov. 30, 2015**

**& Associate Professor (Docent in Swedish) in Didactics - Oct. 07, 2015**

Department of Education at Stockholm University, Sweden.

**Professor in Science Education - March 2011 - Dec. 2016**

Department of Engineering and Chemical Sciences at Karlstad University, Sweden.

**Scientific leader and coordinator - July 01, 2011 to Dec. 31, 2014**

The Centre of Science, Mathematics and Engineering Education Research (SMEER) at Karlstad University, Sweden.

**Member of Faculty Research Strategy Group (Forskningsuteskott) - January 01, 2013 to Dec. 31, 2014**

Faculty of Health, Science and Technology (HNT) & Faculty of Teacher Education (LUN) at Karlstad University, Sweden.

**External Examiner of Teacher Education Program - 2012 to 2014**

- The Hong Kong Institute of Education

**Guest Professor in Germany - Nov. 15 to Dec. 10, 2010**

- Research Unit on Teaching and Learning in Science (NWU-Essen), University of Duisburg-Essen, campus Essen, Germany.

**Guest Professor in Sweden - Feb. 2010 to June 2011**

- The Swedish National Graduate School in Science, Technology and Mathematics Education Research (**FontD**) at Linköping University located in Norrköping, Sweden.
- **Teacher Education Program** at Linköping University located in Norrköping, Sweden.

**Assistant Director (20%) in Sweden - Feb. to July, 2010**

- The Swedish National Graduate School in Science, Technology and Mathematics Education Research (**FontD**) at Linköping University located in Norrköping, Sweden.

**Guest researcher and lecturer in Sweden - Aug. 2009 to Jan. 2010**

- The Swedish National Graduate School in Science, Technology and Mathematics Education Research (**FontD**) at Linköping University located in Norrköping.
- **Teacher Education Program** at Linköping University located in Norrköping..

**Qualified Associate Professor (equal to docent in Sweden) in Taiwan – Feb. 2008 to July 2009**

- College of Liberal and General Education at Aletheia University, Taipei, Taiwan, R.O.C.

**Assistant Professor in Taiwan - Feb. 2005 to Jan. 2008**

- College of Liberal and General Education at Aletheia University, Taipei, Taiwan, R.O.C.

**Guest Professor in Sweden - Aug. 2008 to Jan. 2009**

- The Swedish National Graduate School in Science, Technology and Mathematics Education Research (**FontD**) at Linköping University located in Norrköping, Sweden.

**Visiting scholar in Europe - Aug. to Sept., 2007**

(Sponsored by NSC 96-2517-S-156-001-)

- Sweden –The Swedish National Graduate School in Science, Technology and Mathematics Education Research (FontD) at Linköping University located in Norrköping.
- Finland – Department of Applied Science of Education, University of Helsinki.
- Denmark – Institute of Naturfagenes Didaktik (IND), Københavns Universitet.
- France – Laboratoire de Didactique des Sciences Physiques (LDSP), Université Paris



Diderot – Paris 7.

**Visiting scholar in Germany - Feb. 2006**

- Kiel University (IPN) and Freie University (Didactics of Chemistry)

**Post-doctor in Taiwan - Nov. 2004 to Jan. 2005**

- Graduate Institute of Science Education, National Taiwan Normal University

**Adjunct Lecturer in Taiwan - Aug. 2002 to Jan. 2005**

- Department of Elementary Education, Taipei Municipal Teachers College, Taiwan
- Center for General Education, National Taiwan University of Arts, Taiwan
- Center for General Education, Chang Gung University, Taiwan
- Food and Beverage Management Department, Yuanpei University of Science and Technology, Taiwan

**Visiting scholar in Germany - July 2002 to Aug. 2002**

- IPN at Kiel University in Germany

**Research assistant in Taiwan - Feb. 2001 to Dec. 2002**

- The project of developing assessments to evaluate science learning in secondary school. (NSC89-2525-S-003-012-X3 \ NSC90-2511-S- 003-101-X3)

**Clinical Research Associate in Taiwan and Switzerland - July 1999 to April 2000**

- Medical department of Roche products Ltd., Taiwan.

**Principle Investigator of National Science Council (summer student project) - June 1996 to Feb. 1997**

- Prof. Tsai Ching Mine's lab for researching "Dose smoke induce the oxidation of human low density lipoprotein?" in Fu Jen Catholic University. (This research won the "Research Creativity Award from National Science Council in 1997")

**Trainee dietitian in Taiwan - Aug. 1996 to Sep. 1996**

- Mackay Memorial Hospital, Taipei, Taiwan, R.O.C.

**Research assistant in Taiwan - July 1995 to Aug. 1995**

- Diabetes Mellitus Center of National Taiwan University Hospital, Taipei, Taiwan, R.O.C.

**Teaching**

**Higher education (University staff level)**

- 2018/2019 - spring term (CeUL at Stockholm University): gave workshop on ‘Utilizing digital resources to enhance teaching and learning’.
- 2018/2019/2020/2021 - spring & autumn terms (CeUL at Stockholm University): lecturer in UL1 blended course. Lecture title: Understanding learning: theories and critique.

**Research level (PhD level):**

- 2018/2019/2021 - 50% seminar readers for PhD student thesis text
  - Dagmar Hedman; preliminary title: Making, Mentoring and Methods in 21<sup>st</sup> Century STEM Learning (2021-01-21)
  - Carles Fuster: Preliminary title - Intentional and unintentional lexical transfer in multilingual students of Spanish in Sweden (monograph) (2019-09-23)
  - Reece Curtis: preliminary title - Charting the Course: Exploring the transitions of higher education Students (2018-01-18)
- 2018/2020/2022 autumn (Department of Education at Stockholm University): Publication strategies in the course of Academic Literacy.
- 2015 spring & 2018/2020/2022 autumn (Department of Education at Stockholm University): Introduction to Quantitative Methods in Educational Research.
- 2017 spring (Department of Education at Stockholm University): Theories and Methodology (Course responsible teacher).
- 2015 spring/2018 autumn/2020 autumn (Department of Education at Stockholm University): Introduction to quantitative methodology course (7.5hp).
- 2011 spring – 2014 autumn: Trends in science, technology and mathematics educational research (5hp) for research level at Karlstad University in Sweden.
- 2013 autumn: Literature course - Teachers professional development (TPD) in science education – bridging curriculum, research and practice (10hp) at Karlstad University in Sweden.
- 2013 autumn and 2014 autumn: Philosophy and history of science (Vetenskapernas filosofi och historia) for research level at Karlstad University in Sweden (invited lecture talking about *quantitative and qualitative method in social science*).
- 2012 spring: Literature course: the assessment of argumentation (6hp) for research level at Karlstad University in Sweden.
- 2011 spring: Science in Early Childhood Education (SECE) (7.5hp) for research level in FontD (The Swedish National Graduate School in Science, Technology and Mathematics Education Research) at Linköping University in Sweden.
- 2008 autumn - 2009 spring: The coordinator as well as a lecturer for a Lic-PhD course (NVT Ma-did, 15hp) for research level in FontD (The Swedish National

Graduate School in Science, Technology and Mathematics Education Research) at Linköping University in Sweden.

- o Research Approach in NVT Ma-did (15hp)
- o Scientific Writing and Reviewing Process in a Communication of Science (6hp).

**Master program:**

- 2020/2021/2022 autumn (for International Comparative Education Master program in The Department of Education at Stockholm University):
  - o Course leader and lecturer for the course termed Education for Sustainable Development
- 2019/2020/2021/2022 to date (The Department of Education at Stockholm University): course leader for Master Thesis examination course (PEA460/DIA35F).
- 2018/2019/2020/2021/2022 - autumn term (for International Comparative Education Master program in The Department of Education at Stockholm University):
  - o Course leader (from 2018) for the course termed Specialised Literature (7.5hp).
- 2015/2017/2018/2019/2020/2022 – spring term (for International Comparative Education Master program in The Department of Education at Stockholm University):
  - o Giving lectures on Quantitative Methodology, SPSS workshop as well as guiding seminar discussions on quantitative methodology in the Introduction to Educational Research Methods (IERM) course.  
Course leader from 2020
- 2015/2017/2018/2019/2020/2022 – spring term (for International Comparative Education Master program in The Department of Education at Stockholm University):
  - o Master thesis supervision and examination.
- 2014/2017/2018/2019 – autumn term (for International Comparative Education Master program in The Department of Education at Stockholm University):
  - o Seminar teacher and examiner in Educational Planning course.
- 2014/2016/2017 – autumn term (for International Comparative Education Master program in The Department of Education at Stockholm University):
  - o Independent Study on International Education (15hp).
- 2012 spring: SSI and argumentation in an Afghanistan master program (a distance course provided at Karlstad University in Sweden).
  - o Examiner for their master theses in 2013 spring at Karlstad University in Sweden.

**Undergraduate level:**

- 2019 spring (Department of Education at Stockholm University):
  - Examiner for thesis work (2019 January)
- 2015 spring (Department of Education at Stockholm University):
  - Two lectures on quantitative research in Educational Research (Pedagogisk forskning II and III) course and one lecture in Vocational Education
- 2014 autumn (Department of Education at Stockholm University):
  - Assessment (DID II) (7.5hp) guiding one group of students' seminar discussion
  - Independent Study (15hp): ground level and advanced level
- 2013 autumn: Teacher education program for undergraduate level at Karlstad University in Sweden (Invited lecture talking about *research questions in science and technology education*)
- 2010 autumn – 2011 spring: Människan-kroppsfunktioner och hälsa for undergraduate level in the Teacher Education Program at Linköping University in Sweden (together with Prof. Lena Tibell) (\*A total of one-week involvement).
- Feb. 2005 - July 2009: I have taught different courses regarding Research Method, Logic, Critical Thinking, Cognitive Psychology, and The Introduction of Natural Sciences for undergraduate level at Aletheia University in Taiwan
- Aug. 2002 - Jan. 2005 (adjunct teaching) (Total 216 hours each per course per term, and two terms per year):
  - The development of teaching materials and approaches for K12 pre-service teacher program at Taipei Municipal Teachers College in Taiwan.
  - Nutrition & Health and The Application of Biotechnology courses for the liberal education at the undergraduate level at both of Chang Gung University and National Taiwan University of Arts in Taiwan.

### **Honors and Awards**

- 2017 Research proposal development grant (90238 SEK) at Stockholm University/Sweden
- 2013 Research proposal development grant (60000 SEK) at Karlstad University/Sweden
- 2012 Research proposal development grant (60000 SEK) at Karlstad University/Sweden
- 2007 NSC European research visiting scholar grant (Aug. to Sept 2007)/Taiwan, R.O.C.
- 2006 NSC/DAAD International visiting scholar grant ( Feb. 2006 ) /Taiwan, R.O.C. & Germany
- 2005 International young researcher scholarship from National Association for Research in Science Teaching (NARST)/U.S.A.
- 2005 Travel grant support for scholar to attend international conference (NARST) from National Science Council (NSC)/Taiwan, R.O.C.
- 2004 Travel grant support for PhD student to attend international conference (NARST) from Ministry of Education/Taiwan, R.O.C.
- 2003 Excellent Ph.D. student scholarship, National Taiwan Normal University/Taiwan, R.O.C.

- 2003 Travel grant support for PhD student to attend international conference (NARST) from Ministry of Education/U.S.A.
- 2002 NSC/DAAD summer program scholarship ( July ~ Aug. 2002 ) /Taiwan, R.O.C. & Germany
- 1997 Research Creativity Award from National Science Council in 1997 (NTD 30,000) /Taiwan, R.O.C.

### **Invited Lecturer and Keynote Speech**

- 2020 Invited speaker at a Webinar on ‘science communication’ organized by VR and Linköping University (September 28, 2020). Title: Science Communication: an emerging field in Sweden.
- 2020 Invited speaker at a joint Webinar organized by Stockholm University, KI, KTH and Tokyo University (September 16-18, 2020). Title: Developing scientific media literacy for ESD and global citizenship education.
- 2020 Invited speaker at joint symposium organized by Stockholm University and Tokyo University (Feb. 24 and 25, 2020). Location: Stockholm University. Title: 5th–10th-grade in-service teachers’ pedagogical content knowledge (PCK) for sustainable development in outdoor environment.
- 2018 International Conference on Educational Innovation (ICEI 2018) at Tsing-Hua University (Nov. 16, 2018) (Keynote).
- The 4th Stockholm University and University of Tokyo joint international symposium at Stockholm University/Sweden (Feb. 23-25, 2018) (Keynote).
- Symposium on Chemistry and Science Education, University of Bremen in Germany (19-21 June, 2014) (Keynote)
- Institute of Education (IOE), University of London, London, UK (May 27<sup>th</sup> 2014). (Invited lecturer)
- Graduate Institute of Science Education at National Taiwan Normal University, Taipei, Taiwan (March 13, 2014). (Invited lecturer)
- Freudenthal Institute for Science and Mathematics Education (FIsmE), Chemistry Education Group at Utrecht University in The Netherlands (Feb. 17, 2014). (Invited lecturer)
- APU-visit (senior high students’ visit to Karlstad University), Karlstad University, Sweden, Feb. 02 and 07, 2012. (Invited lecturer)
- Department of Mathematics and Science Education (MND), Stockholm University, Sweden. January. 24<sup>th</sup>, 2012. (Invited lecturer)
- Department of Life Sciences & Institute of Genome Sciences at National Yang-Ming

- University, Taipei, Taiwan, R.O.C., Oct. 27, 2011. (Invited lecturer)
- Research Unit on Teaching and Learning in Science (nwu-Essen), University of Duisburg-Essen, campus Essen (Germany), Nov. 25, 2010 (Invited lecturer).
  - Georg-August-Universität Göttingen, Didactics of Biology (Germany), Nov. 26, 2010 (Invited lecturer).
  - Pedagogic practices at Linköping University (Norrköping/Sweden), Sept. 15, 2010. (Invited lecturer)
  - Department of Social and Welfare Studies at Linköping University (Norrköping/Sweden), Sept. 08, 2010. (Guest lecturer)
  - Science, Mathematics and Engineering Education Research (SMEER) Group at Karlstad University (Karlstad/Sweden), Feb. 11, 2010. (Invited lecturer)
  - European Joint Meeting of Graduate Schools (Rovaniemi/Finland), November 2009. (Workshop)
  - FontD national program at Linköping University (Norrköping/Sweden), autumn 2009. (Guest lecturer)
  - PDGE program at The University of Hong Kong (Hong Kong/China), May 2009. (Invited lecturer)
  - Science Education Research Group (SERG), University of Kwa Zulu Natal (Pietermaritzburg/South Africa), October 2008. (Invited lecturer)
  - The Swedish National Graduate School in Science, Technology and Mathematics Education Research (FontD) (Malmö/Sweden), October 2008. (Keynote)
  - The Chinese University of Hong Kong (Hong Kong/China), May 2007. (Invited lecturer)
  - Chungbuk National University (Cheongju/Korea), July 2006. (Keynote)
  - National Taiwan University of Technology (Taipei/Taiwan, R.O.C.), October 2005. (Invited lecturer)

### **Service to Professional Organizations**

#### **Journals:**

Editorial and advisory board: *Educational Innovations and Emerging Technologies* (Singapore) (2020 to date) & *Asia-Pacific Forum on Science Learning and Teaching* (*APFSLT* / ISSN Journal, Hong Kong) (2005 to date)

Paper reviewer, *International Journal of Science and Mathematics Education* (SSCI Journal) (2007 - to date)

Paper reviewer, *Research in Science and Technology Education* (SSCI journal) (2016 - to date)

Paper reviewer, *Journal of Biological Education* (SCI journal) (2013 – to date)

Paper reviewer, *Journal of Nano Education* (ISSN journal) (2013 – to date)

Paper reviewer, *Culture Studies of Science Education* (ISSN journal) (2013- to date)

Paper reviewer, *NorDiNa (Nordic Studies in Science Education)* (ISSN journal) (2012- to date)

Paper reviewer, *Science Education* (SSCI journal). (2011 – to date)

Paper reviewer, *International Education Studies (IES / ISSN journal)* (2011 - to date)

Paper reviewer, *Creative Education (CE / ISSN journal)* (2011 - to date)

Paper reviewer, *Public Understanding of Science* (SSCI Journal) (2009 - to date)

Paper reviewer, *International Journal of Science Education* (SSCI Journal) (2007 - to date)

Paper reviewer, *Educational Technology & Society* (SSCI Journal) (2006 - to date)

Paper reviewer, *Journal of Research in Science Teaching* (SSCI Journal) (2005 - to date)

Paper reviewer, *Asia-Pacific Forum on Science Learning and Teaching (APFSLT / ISSN Journal, Hong Kong)* (2005 - to date)

Paper reviewer, *Studies in International Cultures* (ISSN journal, Taiwan, R.O.C.) (2008 - to date)

Paper reviewer, *Journal of Teacher Education and Educators* (2023 - to date)

Editorial board, *Asia-Pacific Forum on Science Learning and Teaching (APFSLT / ISSN Journal, Hong Kong)* (2005 - to date)

Associate editor and paper reviewer, *Research and Development in Science Education Quarterly* (ISSN journal) (2011- 2013)

#### **Paper reviewers for conferences/conference proceedings:**

- International Organization of Science and Technology Education (**IOSTE**) in 2018.
- Nordic Research Symposium on Science Education (**NFSUN**) in 2014.
- The Biennial Meeting of the European Science Education Research Association (**ESERA**) in 2013.
- Proceeding of The 8th Conference of European Researchers in Didactics of Biology (**ERIDOB**) in 2012.
- The Biennial Meeting of the European Science Education Research Association (**ESERA**) in 2011
- Proceeding of The 8th Conference of European Researchers in Didactics of Biology (**ERIDOB**) in 2010.

- Editorial Board, The Proceeding of The 23<sup>rd</sup> Biennial Conference of the Asian Association for Biology Education (**AABE**) in 2010.

#### **Organizer/co-organizer of seminars and conferences**

- ICEPS 2014 (International Conference on Education, Psychology and Social Sciences). Aug. 6-8, **2014**, Grant Hotel, Taipei, Taiwan, R.O.C. (Conference chair)
- Seminar of General Education and International Culture Studies: the international section, April 24, **2009**, Taipei/Taiwan. (Organizer)
- International Seminar of General Education and International Culture Studies: the international section, May 10, **2008**, Taipei/Taiwan. (Organizer)
- Taiwan-Sweden Science Education Seminar, May 09, **2008**, Taipei/Taiwan. (Organizer)
- IUPAC-YAC in Taiwan, Nov. 22-26, **2004**, Taipei/Taiwan. (Co-organizer)
- International Conference of Science and Mathematics Education. Dec. 16-18, **2003**, Taipei/Taiwan. (Co-organizer)
- International Symposium on Cognitive Science and Science Education, June 26-29, **2001**, Taipei/Taiwan. (Co-organizer)

#### **Program organizing committee member**

- The 8<sup>th</sup> Conference of Network for Inter-Asia Chemistry Educators (NICE 2019) (Taipei, Taiwan, R. O. C., July 30-Aug. 01, 2019).
- The Global Chinese Conference on Science Education (GCCSE 2010) (Hong Kong, China/Dec. 21-22, 2010).
- The 8th International Conference on Web-based Learning (ICWL 2009) (Aachen, Germany/Aug. 19-21, 2009).
- The 7th International Conference on Web-based Learning (ICWL 2008) (Jinhua, China/Aug. 20-22, 2008).
- The XIII Conference of International Organization for Science and Technology Education (Izmir, Turkey/Sept. 21-26, 2008).
- The 23<sup>rd</sup> Annual Meeting of Science Education in Taiwan (Kaohsiung, Taiwan/Dec. 13-15, 2007)



- The 2nd Network for Inter-Asian Chemistry Educators symposium (NICE) (Taipei, Taiwan/July 30-31, 2007)
- The 11th Global Chinese Conference on Computers in Education (GCCCE) (Guangzhou, China/May 26-30, 2007)
- The 22<sup>nd</sup> Annual Meeting of Science Education in Taiwan (Taipei, Taiwan/Dec. 15-16, 2006)

### **Organizational Affiliation**

2006 to date - Fellow and member of subcommittee of International Union of Pure and Applied Chemistry (IUPAC)

[http://www.iupac.org/nc/home/about/members-and-committees/member-and-people/member-details.html?tx\\_wfqbe\\_pi1%5BACT\\_CONTACTID%5D=5C356320-21D9-4C6D-93A7-C1EB0D3B9880](http://www.iupac.org/nc/home/about/members-and-committees/member-and-people/member-details.html?tx_wfqbe_pi1%5BACT_CONTACTID%5D=5C356320-21D9-4C6D-93A7-C1EB0D3B9880)

2006 to date - Member of Chinese Society for Science Education

2000 to date - Member of The Chinese Society of Cell and Molecular Biology

2006 to 2008 - Member of International Organization of Science and Technology Education (IOSTE) & East Asia Representative (2006 - 2008)

2003 to 2005 - Member of National Association for Research in Science Teaching (NARST)