Call for 2019 Conference Proposals

IMPROVING SCIENTIFIC LITERACY FOR ALL STUDENTS

Alliance of Improving Scientific Literacy for All Students (AISL-AS)

Collaborative Innovation Center of Assessment for Basic Education Quality (CICA-BEQ)

Beijing Normal University

Beijing, China · Tuesday, Oct. 29 – Wednesday , Oct. 30, 2019[1]

[1] On Oct. 28 an organized trip to local school will be held

Keynote Speaker

Dr. Richard A. Duschl

Lyle School of Engineering

Southern Methodist University

Dr. Sibel Erduran

Department of Education

Oxford University

Dr. Joseph Krajcik

CREATE for STEM Institute

Michigan State University

Theme

Scientific literacy is evolving as an essential literacy for modern citizens, due to the rapid development of science and technology in the 21st century. To clarify this fundamental aspect of science education in this new era, we need to rethink and redefine the concept of scientific literacy. Driven by the evolution of scientific literacy, systemic reforms embedded in data-driven and technology-based approaches are needed to improve science education quality. The AISL 2019 conference examines four essential topics to guide research and practice in scientific literacy. We welcome researchers and graduate students from all countries to submit proposals addressing existing efforts being made to cultivate every learner's development of their scientific literacy.

Strand 1: Scientific literacy in the 21st Century

Co-Chairs

Dr. David Fortus	Department of Science Teaching, Weizmann Institute of Science
Dr. Enshan Liu	College of Life Science, Beijing Normal University

Science and technology are everywhere one looks. They can be seen in the food we eat, the houses we live in, the ways in which we communicate,

the things we do to be healthy and to recuperate when sick, the ways we learn and teach, the things we do as pastimes, the list is never-ending… This strand will look at the degree to which science literacy, that is knowledge of, desire to and ability to engage with science could and should play an important role in people's lives. We will focus on the following questions:

1. Is there one scientific literacy or should there be different types and levels of scientific literacy for different groups in the populations. For example, does scientific literacy play the same role for a citizen of Beijing as it does for a resident of central Africa, Papua New Guinea, a refugee from Syria, or a citizen of Germany? How does one define scientific literacy in a way that is relevant to all people, regardless of where they live?

2. Regardless of the level or type of scientific literacy one has when one graduates from school, this literacy will not suffice to allow one to engage thoughtfully in future issues that will develop. To be a truly informed and involved citizen, one needs a level of understanding that lies beyond most high school graduates. In addition, one needs to continue learning, to stay abreast of the latest development, to be able to distinguish between falsehoods and truths. Thus, an important component of scientific literacy is the motivation to remain informed of science and a belief in one's ability to do so. How can we generate this ongoing need-to-know in future citizens?

3. In many countries, science and mathematics are elevated above other subjects because of their importance to the countries' economic robustness. However, this may no longer be true in the not-so-distant future. For example, developments in AI are allowing machines to replace humans in ever more jobs. Will scientific literacy still be as important in a future?

Strand 2: Teaching, Learning and Assessment

Co-Chairs

Dr. Knut Neumann	Leibniz-Institute for Science Education at the University of Kiel
Dr. Jing Lin	Collaborative Innovation Center of Assessment for Basic Education Quality, Beijing Normal University

At the dawn of the 21st century how we live and work is continuously changing as information and communication (ICT) expand their capabilities. In order to be prepared for the challenges that the future may bring, students are expected to develop a scientific literacy that will serve as a basis for meaningful future, life-long learning. This strand will look at how we can meaningfully teach students scientific literacy, and how assessments can help support students learning in formative ways. More specifically, we will focus on the following questions:

1. How should the teaching of scientific literacy differ from current ways of teaching? Scientific literacy is more than just knowledge and skills, it is the integration of a range of different knowledge, skills and abilities that enables the literate person to solve complex, sometimes insoluble problems. The question is what instruction needs to look like in order to support students to develop this capability?

2. What should valid assessments of scientific literacy look like? Clearly, traditional formats of assessments (alone) fail to capture the complexity and depth of the idea of being scientifically literate. The question is what (system of) assessments can capture the complexity of scientific literacy and more importantly how can these assessments incorporate a developmental perspective that will provide formative information to support students learning?

3. Although we aim to prepare students for a world driven by the quickly growing capabilities of information and communication technologies, these technologies are still rarely used in classrooms – be it for teaching or assessment purposes. The question is how can we use these technologies to non-invasively collect information about students learning, automatically process and analyze this information and subsequently adapt the teaching to students' individual needs?

Strand 3: Curriculum and Digital Resources

Co-Chairs

Dr. Richard L. Lamb	Department of Learning and Instruction, State University of New York at Buffalo
Dr. Chun-Yen Chang	Science Education Center, Graduate Institute of Science Education and the Department of Earth Sciences, National Taiwan Normal University

Improving science literacy of students requires science teachers to be practically and theoretically aware of how to integrate digital resources and

their use to support curriculum. The interface between curriculum and digital resources bears the need for constant examination and reevaluation, due to rapid advancement in these areas. More importantly, the manner in which scientific literacy is examined using these tools changes substantially overtime as content knowledge in science and technology are constantly advancing along with the tools educators have access to in the classroom. Examination of novel understandings about how students learn and best practices on how to teach science are evolving to reflect wider changes in society particularly related to technology. This strand focuses on the role that digital resources can play in the advancement of curriculums promoting scientific literacy. This strand emphasizes the use of evidence-based best practices in the examination and use of digital resources as curricular supports. Guiding questions for this strand are:

1. What are best practices for the integration of digital resources into curricular approaches to promote scientific literacy? In considering science curriculum standards such as the US Next Generation Science Standards and the newly revised Chinese National Science Standards, how will digital resources be used to promote best teaching practices such as inquiry and the like? What is the current state of science teacher knowledge in terms of how to best integrate digital resources? What trends can be identified across countries in terms of digital resources supporting new curriculum standards?

2. What are the current methods available to measure science teacher and student abilities, skills, and impacts of digital resources on identified outcomes? What novel teacher knowledge and skills are expected in the development and use of digital resources for use with science curriculum standards? How to measure teacher practices to promote specific components

of student science literacy using the curriculum and digital resources? What is the relationship between teacher knowledge of digital resources, best practices, and the actualization of teacher classroom practices?

3. What are effective models of preservice teacher development around digital resources as a curricular support? What are effective models of inservice teacher development around digital resources as a curricular support? What differences exist between preservice and inservice teacher needs around digital resources and curriculum development? What criteria, constructs, and skills should be used to evaluate the effectiveness of preservice and inservice teacher education programs in the use of digital resources to promote scientific literacy?

Strand 4: Science Teacher Professional Development

Co-Chairs

Dr. Xiufeng Liu	Department of Learning &Instruction, State University of New York at Buffalo
Dr. Lei Wang	College of Chemistry, Beijing Normal University

Improving science literacy of students requires science teachers to be competent in not only science disciplines but also strategies to engage students in active learning. Given that science and technology are constantly advancing and new knowledge on how students learn and best practices on how to teach science are evolving, science teachers must be life-long learners. This strand focuses on teacher learning along the continuum from preservice to inservice teacher education; it particularly emphasizes evidence-based best practices in

science teacher professional development. Guiding questions for this strand are:

1. What knowledge is expected by new science curriculum standards such as the US Next Generation Science Standards and the newly revised Chinese National Science Standards in High School? What is the current state of science teacher knowledge in terms of knowledge demands by the new science curriculum standards? What trends can be identified across countries in terms of knowledge demands by new curriculum standards?

2. How to measure teacher knowledge, particularly the teacher knowledge expected in new science curriculum standards? How to measure teacher practices to promote specific components of student science literacy (e.g., using scientific models and modeling)? What is the relationship between teacher knowledge and teacher classroom practices? How science teacher knowledge and practices change over a long-time period (e.g., from preservice to the end of first five years of teaching)?

3. What are effective models of preservice and inservice teacher education? What criteria should be used to evaluate the effectiveness of preservice and inservice teacher education programs? How are current preservice and inservice teacher education programs aligned with the new science curriculum standards?

Call for Proposal

Submission to the AISL 2019 conference is open to all education scholars. Submissions will be double blind peer-reviewed. Proposals will be assessed on the strength, accuracy, and originality of the research. Please adhere to the following author guidelines when submitting to the conference:

A proposal submission is an individual paper with one or more co-authors, to be presented as a stand-alone paper, or interactive poster paper. Since we cannot always accommodate the type of session every participant would like, please indicate if you would like to be considered for an alternative format. For example, if there is no room for your presentation as a paper, are you willing to present it as a poster?

Proposals must address and will be reviewed on the following six elements:

1. Research objectives or purposes
2. Theoretical framework/ rationale for the study
3. Research design or procedures
4. Method (e.g., data sources and data analysis)
5. Results and/or substantiated conclusions or warrants for arguments
6. Contribution to the field/ Scientific or scholarly significance of the study

Indicate which strand the proposal aims for to help with assigning appropriate reviewers

Word limits:

1. 15 words or fewer for paper title.
2. 120 words or fewer for abstract.
3. 2,000 words or fewer for paper submission containing no author identification in the paper.
4. References, tables, charts, graphs, images, and figures should be added to the end of the document and are not included in the word count.
5. Submissions will be removed from consideration if the paper exceeds the word limit.

Participant registration and attendance requirement. All presenting authors of accepted papers and all participants in sessions (i.e., session chairs, and discussants) are required to register for and attend the conference in person in Beijing.

Note: Specific format or style, such as APA, is not required.

Submission

- Completed proposals should be submitted online at http://2019.aisl.ink
- The proposal submission system will be live on May 1st and the submission deadline is June 15.
- Submit in PDF format only. Use the following file format: Strand No.-LASTNAME-PROPOSAL.pdf
- Late or incomplete submissions will not be considered.
- Acceptance will be notified through email by the end of July 2019.

Contact information

If you have any questions, please feel free to email the conference organizing committee:

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Collaborative Innovation Center of Assessment for Basic Education Quality at Beijing Normal University (CICA-BEQ) was established in October 2014. It is the only national collaborative innovation center in the field of education and psychology in China. The missions of CICA-BEQ are to construct internationally recognized basic education assessment system with Chinese characteristics; to promote quality education; and to enhance all-round and personalized development of children and adolescents in China.