WERA International Research Network
Social Metacognition and Big Data Network

Yearly Progress Report
April 2020

Ming Ming CHIU
Assessment Research Centre
The Education University of Hong Kong

Our IRN, Social Metacognition and Big Data Network, started to develop theory by using artificial intelligence and advanced statistics to analyze complex, big data on 7 research topics: (i) young children's buddy reading; (ii) students' learning from feedback; (iii) discussions to improve teaching; (iv) primary technicians' problem solving; (v) mathematics problem solving forums; (vi) online debate justifications; and (vii) winning online debates. As of today, we have produced 10 publications (including 8 journal manuscripts, 1 book chapter, and 1 keynote presentation) and 1 grant proposal.

To promote our IRN, we posted information on our official website, sent specific invitations to different groups of scholars, and identified suitable members from our network at our universities and our graduates' universities. During this reporting period, we recruited 8 new members from 5 universities in 2 countries/regions.

Research Publications

(i) Young children's buddy reading

To understand young children readers' social metacognition, we examined the relations between sequences of children's reading behaviors and their comprehension processes, and produced the 3 manuscripts:

Journal manuscripts

- Christ, T., Wang, X. C., Chiu, M. M., & Cho, H. (2019). Kindergarteners' meaning making with multimodal app books: The relations amongst reader characteristics, app book characteristics, and comprehension outcomes. *Early Childhood Research Quarterly, 47*, 357-372. DOI:10.1016/j.ecresq.2019.01.003
- Wang, X. C., Christ, T., Chiu, M. M. & Strekalova-Hughes, E. (2019). Exploring the relationship between kindergarteners' buddy reading and individual comprehension of interactive app books. In A. Bus, S. B. Neuman, & K. Roskos (Eds.). *American Educational Research Association Open,* Special Issue: *Screens, Apps, and Digital Books for Young Children: The Promise of Multimedia*, *5*(3), 1–17. DOI: 10.1177/2332858419869343
- Christ, T., Wang, X. C., Chiu, M. M., & Strekalova-Hughes, E. (2019). How app books' affordances are related to young children's reading behaviors and outcomes. In A. Bus, S. B. Neuman, & K. Roskos (Eds.). *American Educational Research Association Open,* Special Issue: *Screens, Apps, and Digital Books for Young Children: The Promise of Multimedia*, 5(2). DOI: 10.1177/2332858419859843

(ii) Students' learning from feedback

To examine how student and teacher feedback influences students' reflections, we wrote and won a grant for *Unpacking student self-assessment processes: A longitudinal naturalistic experiment* from the Hong Kong Research Grant Council (USD94,610, 2020-2022).

(iii) Discussions to improve teaching

We analyzed conversations in video clips of lessons to help teachers better understand the learning and teaching processes underlying common or unusual events. The following manuscript and keynote presentation presented some of our findings:

Journal manuscript

- Chiu, M. M. (in press). Analyzing classroom talk: An integration of artificial intelligence and statistics. *PKU Education Review*.

Keynote presentation

- Chiu, M. M. (2019, May). *Toward automatic analyses of classroom conversations.* Presented as part of the Global Chinese Conference on Computers in Education. Wuhan, People's Republic of China.

(iv) Primary technicians' problem solving

We ran statistical discourse analysis of over 30,000 turns of talk by 259 people during 43 team meetings to explore disagreement in team collaboration. Then, we wrote the following book chapter.

Book chapter

- Gerpott. F. H., Chiu, M. M., & Lehmann-Willenbrock, N. (in press). Multilevel antecedents of negativity in team meetings: The role of job attitudes and gender. In A. L. Meinecke, Allen, J. A., & Lehmann-Willenbrock, N. (Ed.) *Managing Organizational Meetings* (pp. 143-161). Bingley, UK: Emerald.

(v) Mathematics problem solving forums

We tested the influence of student actions in mathematics problem solving, and the quality of students' solutions. Below are two resulting publications:

Journal manuscripts

- Xin, Y. P., Chiu, M. M., Tzur, R, Ma, X., Park, J. Y. & Yang, X. (in press). Linking teacher-learner discourse with mathematical reasoning of students with learning disabilities: An exploratory study. *Learning Disability Quarterly.* DOI:10.1177/0731948719858707 Impact factor: 2.132
- Chiu, M. M., & Huang, X. (submitted). Statistical discourse analysis: Students' group problem solving. *Journal of Global Education*.

(vi) Online debate justifications

To examine conflicts in the form of online debates and how social antecedents influence students' use of justifications, we analyzed over 2,000 online messages by over 80 graduate students during four weekly online debates, and produced the following manuscript:

Journal manuscript

- Chiu, M. M., & Jeong, A. (in press). Gender, social distance, and justifications: Statistical discourse analysis of evidence and explanations in online debates *Educational Technology Research and Development.* 0.1007/s11423-020-09739-8

(vii) Winning online debates

We also examined whether online debaters' politeness or rhetorical tactics help win over audience votes, and submitted the following manuscript:

Journal manuscript

- Chiu, M. M, Oh, Y. W., & Kim, J-N. (submitted). Politeness effects on audiences during online debates: Not agree vs. disagree vs. reject. *Nature: Human Behavior.*

New Network Members

Our IRN has recruited 8 new members from 5 universities in Hong Kong and the United States. Currently, our network has 36 members from 20 universities in 9 countries/regions (Australia, Germany, Japan, Hong Kong, mainland China, Norway, South Korea, Taiwan, and the United States). Below please find the list of our new members (in alphabetical order):

Maureen P. BOYD
University at Buffalo
Associate Professor
Learning and Instruction Department
North Campus, NY 14260-1000, USA
mpboyd@buffalo.edu

Bonnie CHOW
City University of Hong Kong
Associate Professor, Department of Social and Behavioural Sciences
Tat Chee Ave, Kowloon Tong
Hong Kong
wychow@cityu.edu.hk

Siu Cheung KONG
The Education University of Hong Kong
Professor, Department of Mathematics and Information Technology
E-1/F-01A, 10 Lo Ping Road, Tai Po
Hong Kong
sckong@eduhk.hk

Minnie Ming LI
The Education University of Hong Kong
Lecturer II
D2-1/F-11, 10 Lo Ping Road, Tai Po,
Hong Kong

lim@eduhk.hk

Alpha Man Ho LING
The Education University of Hong Kong
Assistant Professor, Department of Mathematics and Information Technology
D3-2/F-22, 10 Lo Ping Road, Tai Po
Hong Kong
amhling@eduhk.hk

Leonard Kin Man POON
The Education University of Hong Kong
Assistant Professor & Associate Head
Department of Mathematics and Information Technology
D3-1/F-43, 10 Lo Ping Road, Tai Po
Hong Kong
kmpoon@eduhk.hk

Ekaterina STREKALOVA-HUGHES
University of Missouri-Kansas City
Assistant Professor, Urban Teacher Education/Early Childhood Education
School of Education, 314 Education Building,
615 E. 52nd Street, Kansas City, MO 64110, USA
strekalovahughese@umkc.edu

Yan Ping XIN
Purdue University
Professor, Department of Educational Studies
610 Purdue Mall, West Lafayette
IN 47907, USA
yxin@purdue.edu