

CURRICULUM VITAE

NI, YU-JING

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EDUCATION

Ph.D. (1994, UCLA); M.A. (Ed) (1989, UCLA); BA (Ed.) (1982, Beijing Normal University)

ACADEMIC AND RESEARCH APPOINTMENT

Associate Professor, Department of Educational Psychology, CUHK (2002-)

RESEARCH

RESEARCH GRANTS

Understanding effects of curriculum reform on student learning and development in Context. Principal Investigator. RGC Earmarked Grant, 2008-2009, HK\$ 387,700.

Effects of curriculum reform on student learning in the context of classroom and student family. PI, Direct Grant, 2007-2008, HK\$ 78,980.

Has curriculum reform made a difference? Looking for change in classroom practice. RGC earmarked grant, 2005-2008, PI, HK\$ 589,000.

Has curriculum reform made a difference? Looking for change in classroom practice. National Center for School Curriculum and Textbook Development, Ministry of Education, PRC, 2005-2008, PI, RMB 330,000

Partnership for improvement of learning and teaching. Education and Manpower Bureau of Hong Kong, 2004-2009, Co-Investigator with John C. K. Lee as PI, HK\$28,000,000.

Facilitating the development of fraction concepts in third-grade classrooms: Measurement approach, Direct Grant, 2004-2005, PI, HK\$ 68,000.

Relations of preferential processing modes to intra-individual decalages in cognitive development. Direct Grant, 2001-2002, PI, HK\$ 65,000.

Detecting developmental transitions in understanding class-inclusion relations. Direct Grant, 1999-2000, PI, HK\$ 30,000.

Setting Chinese and English standard for primary and secondary Students in Hong Kong. Hong Kong Education Department, 1999-2000, Co-Investigator with Prof. K. T. Hau as PI, HK\$490,000.

- Representational fluency and principled understanding of fraction.* Direct Grant, 1997-1998, PI, HK\$ 19,000.
- Performance variation in classification tasks in relation to operational level and content knowledge level.* Direct Grant, 1997-1998, PI, HK\$ 47,500.
- An evaluation of the 9-year compulsory education in Hong Kong (2nd Phase): Curriculum, teachers' knowledge, learning process and their relationship with student learning difficulties.* RGC earmarked grant, 1997-1999, Co-Investigator with Prof. H. W. Wong as PI, HK\$ 532,000.00.
- A research on the 9-year compulsory education: Aims, objectives, and implementation.* Hong Kong Education Department, 1996-1997, Co-Investigator with Prof. H. W. as PI, HK\$ 980,000.00.

REFERRED PUBLICATIONS

- Li, Q., & Ni, Y. J. (2007). Debates on the reformed mathematics curriculum in compulsory education of the Chinese mainland. *Taiwan Journal of Mathematics Teachers, 11*, 1-11. (in Chinese)
- Ni, Y. J., Li, Q., Wong, W. C., Shiu, L. P., & Cheng, P. W. (2006). Learning to teach: Tracing and understanding changes in organization of pedagogical knowledge of pre-service teachers. *Educational Journal, 34*(1), 47-83.
- Li, Q., & Ni, Y. J. (2006). Influences of teacher variables on mathematics achievement of elementary school students: A multi-level of analysis. *Journal of Teacher Education Research, 3*, 74-80. (in Chinese)
- Ni, Y. J., & Zhou, Y. D. (2005). Teaching and learning fraction and rational numbers: The origin and implications of whole number bias. *Educational Psychologist, 40*(1), 27-52.
- Li, Q., & Ni, Y. J. (2005). A review of different approaches to research on teacher knowledge. *Comparative Education Review, 27*(5), 76-81 (in Chinese)
- Li, Q., Ni, Y. J., & Shiu, L. P. (2005). A comparative study of expert teachers and novice teachers in elementary mathematics subject knowledge, *Journal of Educational Studies, 6*(6), 57-64 (in Chinese).
- Li, Q., & Ni, Y. J. (2004). Change in the theory of knowledge and the change of teachers' role in their professional development, *Journal of East China Normal University (Educational Sciences), 22*(4), 31-37(in Chinese).
- O'Neil, H. F., Ni, Y. J., Baker, E. L. (2002). Assessing problem solving in expert systems using human benchmarking. *Computers in Human Behavior, 18*, 745-759.
- Ni, Y. J. (2001). Semantic domains of rational number and acquisition of fraction equivalence. *Contemporary Educational Psychology, 26*, 400-417.
- Ni, Y. J. (2000). How is it valid to use number lines to measure children's

- understanding of rational number concepts? *Educational Psychology*, 20, 139-152.
- Ni, Y. J. (1999). Understanding of the meanings and equivalence of fractions in fifth and sixth graders. *Psychological Development and Education*. 15, 26-30.
- Ni, Y.J. (1998). Cognitive structure, content knowledge, and classificatory reasoning. *Journal of Genetic Psychology*, 159(3), 280-296. (collected by Archives Jean Piaget, University of Geneva, Switzerland)
- Ni, Y. J. (1998). Is classificatory reasoning is a content-knowledge-based competence? *Psychologia*, 41, 144-154. (collected by Archives Jean Piaget, University of Geneva, Switzerland)
- Ni, Y. J. (1997). Performance-based assessment: Problems and design strategies. *Educational Journal*, 25(2), 137-157.
- O'Neil, H.F. Jr., Baker, E. L., Ni, Y. J., Jacoby, A., & Swigger, K. M. (1994). Human benchmarking for the evaluation of expert systems. In E. L. Baker & H. F. O'Neil (Eds.), *Technology assessment* (pp. 13-45). Hillsdale, NJ: Lawrence Erlbaum.

RESEARCH REPORTS

- Ni, Y. J., Li, Q., Cai, J., & Hau, K. T. (2007). *Accomplishments and problems of mathematical curriculum reform in compulsory education of the Chinese mainland: Looking for evidence of student learning outcomes*. The Chinese University of Hong Kong.
- Wong, H. W. , Lee, C. K., Ni, Y. J., Hau, K. T., & others (2000). *An evaluation of the 9-year compulsory education in Hong Kong: Curriculum, teachers' knowledge, learning process and their relationship with student learning difficulties*. The Chinese University of Hong Kong: Hong Kong Institute of Educational Research.
- Ni, Y. J. (1993). *Assessment specifications in American history and scoring rubrics to upper elementary level history assessment*. Los Angeles, University of California, National Center for Research on Evaluation, Standards, and Student Testing.
- Baker, E. L., Niemi, D., Aschbacher, P., Ni, Y. J., & Yamaguchi, E. (1991). *Using cognitive sensitive assessment of History*. Los Angeles, University of California, National Center for the Research on Evaluation, Standards, and Student Testing.
- O'Neil, H. F., Ni, Y. J., Jacoby, A., & Swigger, K. M. (1990). *Human benchmarking methodology for expert systems*. Los Angeles, University of Southern California, Cognitive Science Laboratory and University of California, National Center for the Research on Evaluation, Standards, and Student Testing, University of California.
- O'Neil, H. F., Ni, Y. J., Jacoby, A., & Swigger, K.M. (1990). *Human benchmarking studies of expert systems*. Los Angeles, CA: University of Southern California, Cognitive Science Laboratory and University of California, National Center for the Research on Evaluation, Standards, and Student Testing, University of California.

CONFERENCE PRESENTATIONS

- Ni, Y. J., Q. L., Cai, J., Hau, K. T., Liu, H. Y., & Zhang, Z. H. (2008, March). Effects of a reformed curriculum in primary mathematics. Paper presented at the annual meeting of American Education Research Association, New York, USA.
- Ni, Y. J., Li, Q., Cai, J. Hau, K., T., & Liu, H. Y. (2007, October). *Effects of Curriculum Reform: Looking for Evidence of Student Learning Outcomes*. Paper presented at the 38th Annual Conference of the North East Education Research Association Hartford, Connecticut, USA.
- Ni, Y. J., Zhang, Z. H., & Li, Q. (2006, August). *Propositional vs. analog processing: A source of developmental decalage?* Paper presented at the annual meeting of the American Psychological Association, New Orleans, USA.
- Ni, Y. J. (2004, July). *Continuity and discontinuity between semantic and logical knowledge: The case of class-inclusion*. Poster present at the 2004 convention of International Society for the Study of Behavioral Development, Ghent, Belgium.
- Ni, Y. J. (2004, April). Students' responses to number lines: A window into the relationship between learning representation conventions and learning fraction and rational numbers. Part of a roundtable symposium "*The role of representation in mathematics learning and teaching: The case of fraction*" at the annual meeting of the American Education Research Association, San Diego, CA., USA.
- Ni, Y. J. (2001, October). *Number lines as assessment procedure for diagnostic utility and achievement estimation*. Paper presented at the 5th biannual meeting of the Chinese Society for Study of Educational and Psychological Measurement, Taipei, Taiwan.
- Ni, Y. J. (2000, July). *Validity of the assessment procedure using number lines to assess children's understanding of rational number*. Paper presented at the 27th annual meeting of International Congress of Psychology, Stockholm, Sweden.
- Ni, Y. J. (1999, August). *Semantic domains of fraction and the acquisition of fraction equivalence*. Paper presented at the annual meeting of the American Psychological Association, Boston, MA., USA.
- Ni, Y. J. (1998, October). *How well children understand equivalent fractions: Curriculum implications*. Paper presented at the International Conference on Curriculum. North East China Normal University: Chang Chun, China.
- Ni, Y. J. (1998, August). *Representational fluency and principled understanding of rational numbers*. Paper presented at the International Congress of Applied Psychology, San Francisco, CA., USA.
- Ni, Y. J. (1998, April). *Graphical representations of semantically different constructs of fractions: Children's rational number understanding*. Paper presented at the

- annual meeting of the American Education Research Association, San Diego, CA., USA.
- Ni, Y. J. (1997, October). *School-based assessments, public examination, and competence-based education*. Paper presented at the Working Conference on Education in Shanghai and Hong Kong, Shanghai, China.
- Ni, Y. J. (1997, May). *Issues on the changes in the secondary school places allocation systems in Shanghai and Hong Kong*. Paper presented at the Working Conference Toward the 21 Century: Hong Kong and the Mainland, Shen Zhen, China.
- Ni, Y. J. (1996, August). *Performance variation in classification tasks in relation to operational level and content knowledge levels*. Paper presented at the 26th annual meeting of International Congress of Psychology, Montreal, Canada.
- Ni, Y. J. (1995, April). *Effects of cognitive structure and knowledge expertise on children's class-inclusion understanding*. Paper presented at the annual meeting of the American Education Research Association, San Francisco, CA., USA.
- Ni, Y. J., & Chang, H. H. (1998, February). *Performance-based assessments: Some recent developments with an application*. Paper presented at the International Conference on Restructuring the Knowledge Base of Education in Asia, The Chinese University of Hong Kong, Hong Kong.
- Ni, Y. J., Li, Q., Wong, W. C., Shiu, L. P., Chen, P. W. (2002, August). *Learning to teach: changes in pedagogical knowledge of pre-service teachers*. Paper presented at the 110th Annual Convention of American Psychological Association, Chicago, USA.
- Ni, Y. J., Sato, E., Niemi, D., & Baker, E. L. (1993, April). *Assessing content understanding of school geography*. Paper presented at the annual meeting of the American Education Research Association. Atlanta, GA., USA.
- Li, Q., & Ni, Y. J. (2001). *Expert-novice teachers' differences in their professional knowledge*. Paper presented at the annual meeting of the American Psychological Association, San Francisco, CA, USA.
- Wong, H. W., Lee, C. K., Hau, K. T., Ni, Y. J., Hon, H. S., Hui, K. F., & Tsui, C. C. (1996, November). *A research on the 9-year compulsory education: Aims, objectives, and implementation*. A symposium presented at the 13th annual meeting of Hong Kong Education Research Association, Hong Kong.

TEACHING

COURSE TAUGHT

Cognitive Development

- Cognitive Development and Instruction (Undergraduate course, East China Normal University, Shanghai)
- Development of quantitative and numerical reasoning in children (Undergraduate course, East China Normal University, Shanghai)

Psychology of Learning and Teaching

- Cognitive Psychology of Learning and Teaching (Diploma of Education course, the Chinese University of Hong Kong, CUHK)
- Human Abilities in Perspectives (graduate course, CUHK)
- Special Topics in the Science of Learning (graduate course, co-taught, CUHK)
- Methods of Teaching and Learning (undergraduate course, CUHK)

Educational Measurement and Assessment

- Understanding and Constructing Achievement Tests in School (Diploma of Education course, CUHK)
- Planning, implementing and improving assessment for learning in Liberal Studies (Diploma of Education and graduate course, CUHK)
- Educational Measurement and Evaluation (undergraduate course, CUHK)
- Assessment of Learning Process and Outcome (undergraduate course, CUHK)

Research Method

- Methods in Educational Research (Diploma of Education course, CUHK)

SERVICES

PROFESSIONAL SERVICES TO THE COMMUNITY (invited presentations and workshops for schools and government agencies)

- Ni, Y. J. (2007, December) *A study on effects of curriculum reform in compulsory education: Looking for evidence of change in classroom practice and in student learning outcomes*. An invited presentation at the advanced seminar on classroom teaching research organized by National Center for School Curriculum and Textbook Development of Ministry of Education, Beijing, China.
- Ni, Y. J. & Li, Q. (2007, August). *Methodological considerations in research on the effects of curriculum reform*. An invited presentation at the Conference of Curriculum Reform and Change in Classroom Practice in Zhengzhou, China.
- Li, Q., & Ni, Y. J. (2007, August). *Accomplishments and problems of mathematical curriculum reform: Looking for evidence of student learning outcomes*. An invited presentation at the Conference of Curriculum Reform and Change in Classroom Practice in Zhengzhou, China.
- Ni, Y. J. (2006, May). *Focus on classroom: learning task analysis*. Education Department, Zheng Zhou, Henan province.
- Ni, Y. J. (2006, May). *My educational path: East meets West*. Henan Institute of Education, Henan province
- Ni, Y. J. (2006, February). *Focus on classroom: classroom discourse analysis*. Education Department, Zheng Zhou, Henan Province.
- Ni, Y. J. (2003, October). *Guidelines for improving test item quality in classroom assessment*. Queen Maud Secondary School, Hong Kong
- Ni, Y. J. (2002, June). *What we have known about competence assessment?* National Educational Commission of People's Republic of China, Beijing.
- Ni, Y. J. (2002, June). *Performance-based assessments: Problems and application examples*. National Educational Commission of People's Republic of China, Beijing.
- Ni, Y. J. (2001, May). *School-based assessments*. Hong Kong Education Department.
- Ni, Y. J. (1998, May). *Practical and technical issues in the development and scoring performance-based assessments*. Hong Kong Education Department.
- Ni, Y. J. (1992, May). *Performance-based assessment in American History*. San Diego School District, California, USA.

RESEARCH INTERESTS /FIELDS OF SPECIALISM

My primary research interests are cognitive development and classroom instruction and learning.

The interest in cognitive development lies in my constant curiosity with development and origin of knowledge. One of the key issues in developmental research is domain-general and domain-specific determinants of the nature of cognitive development, which touches some of the deepest problems of psychology. Another problem concerns the relationship between structural and functional aspects of the cognitive system. One line of my studies has addressed these questions. The studies of development of classification reasoning were able to differentiate two levels of classification reasoning, by class membership and by class inclusion. The studies suggest semantic and logical knowledge, related though, may follow distinctive developmental trajectories. The studies of children's construction of fraction and rational number concepts demonstrated that the acquisition of fraction equivalence depends on situations and on the specific conceptualizations in addition to general capacities of operational reasoning. These studies added to the clarification of the roles of domain-general and domain-specific determinants in the development of classification reasoning and fraction/rational number concepts, in particular, and intellectual functioning, in general.

The studies of the developmental changes in children's acquisition of fraction and rational number concepts have led to my further investigation into the learning history of children's number concepts that partly explains the persisting difficulty they have encountered in learning about fraction and rational numbers. The resulting literature review paper has shown that there is considerable prior experience and knowledge that infants and young children bring to the number acquisition tasks and there is powerful and enduring effects of the prior experience and knowledge on children's later number concept acquisitions. Innate and environmental constraints are sources of children potentials and growth as well as risk and difficulty. These developmental factors must be considered in order to make classroom instruction effective, that is, teaching and assessment for understanding, for learning, and for development. Sound design of instruction must be based on an understanding of how children learn and construct knowledge and of how teachers can support to optimize the progress toward desired outcomes.

The ultimate goal of my research is to use what I have learned from the study of cognitive development to inform our design of instruction and to facilitate learning and development in students. In collaboration with the National Center for School Curriculum Development of the Ministry of Education of China, I and my collaborators in CUHK, Beijing Normal University and University of Delaware of USA are recently conducting a longitudinal project to determine whether or not the current curriculum reform initiative in China has reached the classroom and influenced classroom practice and student learning.

The research is investigating four types of evidence for change as a result of the curriculum reform. These include the beliefs of teachers about learning and teaching, the cognitive features of the learning tasks that are being implemented, the characteristics of classroom interactions, and student learning outcomes. Sixty classroom teachers and 3,600 students of the classrooms and the students' parents are participating in the study. The research program will establish the relationship between the agents of change (beliefs of teachers), the products (tasks) and processes (classroom interactions) of these agents of change, and student learning outcomes. It will also investigate relationships of the changes with curriculum variables, teacher/classroom variables and student family variables. The study will provide much-needed and multi-facets evidence of whether or not and how the reform implementation has reached the classroom and has influenced classroom practice and student learning at both the individual (student) and the class level (teacher and classroom). More importantly, the results of this research program are expected to contribute substantially to our understanding of the dynamics of development, learning, and teaching in and out of classroom. The understanding will help promote evidence-based educational practice to improve teacher training, classroom teaching, and student learning.