

## Curriculum Vitae

Oh Hoon Kwon

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### CONTACT INFORMATION

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### EDUCATION

**Teacher**, Wisconsin, USA  
*Wisconsin Department of Public Instruction*

Secondary School Mathematics (Grade 5-12), Jul. 2021 - Jun. 2024

**Michigan State University**, East Lansing, Michigan, USA  
*Department of Mathematics, College of Natural Science*

Ph.D. in Mathematics, Jul. 2012

Dissertation: Conceptualizing Vectors in College Geometry: A New Framework for Analysis of Student Approaches and Difficulties

(Field of specialization: Mathematics Education, Mathematics Subject Classification 97)

M.S., Mathematics, May 2005

(Focus of study: Differential Geometry and Differential Topology)

**Seoul National University**, Seoul, South Korea  
*School of Mathematical Science, College of Natural Science*

Graduate Study, Mar. 2001 - Aug. 2002

*Korean National Teacher Certificate, Ministry of Education, South Korea*

Secondary School Mathematics (Middle and High School Levels), Dec. 1999

*Department of Mathematics Education, College of Education*

B.S., Mathematics Education, Dec. 1999

### EXPERIENCE

**Department of Mathematics**  
**College of Letters and Science, University of Wisconsin Madison**, Madison, WI, USA

*Teaching Faculty II, Pre-Calculus Coordinator*

**Sep. 2022 - Present**

Duties included full lectureship, administrative responsibilities, fielding of all student inquiries, advising, training and supervising graduate instructors, developing curricula for Pre-Calculus Program, coordinating and teaching Pre-Calculus courses, and other math courses for undergraduate students.

*Associate Faculty Associate, Math 13x Course Supervisor*

**Sep. 2015 - Aug. 2022**

*Assistant Faculty Associate, Math 13x Course Supervisor*

**Aug. 2011 - Aug. 2015**

Duties included full lectureship, administrative responsibilities, fielding of all student inquiries, advising, training and supervising graduate instructors, developing math content curricula for future elementary and secondary teachers, coordinating and teaching Math 13x courses for elementary education and special education majors., teaching Math capstone course for math major interested in secondary education, and teaching regular math courses for undergraduate students.

Math 96 Algebra (Developmental)

Math 112 Algebra (College Algebra)

Math 113 Trigonometry

Math 114 Algebra and Trigonometry

Math 118 Prep for Calculus (SCE)

Math 130 Mathematics for Teaching: Numbers and Operations

Math 131 Mathematics for Teaching: Geometry and Measurement

Math 132 Problem Solving in Algebra, Probability and Statistics  
Math 135 Algebraic Reasoning for Teaching Mathematics  
Math 136 Pre-Calculus and Calculus for Middle School Teachers  
Math 138 Mathematics for Teaching: Conjecture, Generalization, and Proof  
Math 141 Quantitative Reasoning and Problem Solving (SCE)  
Math 171 Calculus with Algebra and Trigonometry I  
Math 217 Calculus with Algebra and Trigonometry II  
Math 222 Calculus 2  
Math 340 Elementary Matrix and Linear Algebra  
Math 461 College Geometry 1  
Math and Curric. 471 Mathematics for Secondary School Teachers (Capstone in Mathematics)  
Math and His. Sci. 473 History of Mathematics  
Math 475 Introduction to Combinatorics

*SOAR advisor/consultant* **May 2013 - Aug. 2020**  
Duties included advising/consulting prerequisites, course selections, placement tests, degree requirements, transfer credits, and career paths as a math department consultant at Student Orientation, Advising, and Registration Program.

*Instructional Excellence Program Staff* **May 2013 - May 2020**  
Duties included reorganizing math department graduate instructor training and development program, running graduate instructor training sessions, mentoring the graduate instructors.

### **Education Outreach and Partnerships**

**School of Education, University of Wisconsin Madison, Madison, Wisconsin USA**

*Instructional Specialist/AP Calculus AB-BC Instructor* **Nov. 2011 - Jun. 2015**  
Duties included consultation for high school Advanced Placement Calculus teachers, development and planning of the Advanced Placement Summer Institute, delivery, development of resources, and grading.

Curri 675 Advanced Placement Calculus AB/BC seminar

*Co-instructor & Consultant, MMSD Middle School Math Specialist Program* **Jan. 2013 - May 2017**  
Duties included co-teaching or consulting mathematics content knowledge for Madison Metropolitan School District middle school in-service teachers, development and planning of the course, delivery, development of resources.

Curri 640 Mathematical Knowledge for Teaching: Conjecturing and Reasoning  
Curri 639 Mathematical Knowledge for Teaching: Algebra and Functions  
Curri 638 Mathematical Knowledge for Teaching: Geometry and Measurement  
Curri 637 Mathematical Knowledge for Teaching: Ratios and Proportions  
Curri 636 Mathematical Knowledge for Teaching: Number and Generalization

### **Educational Psychology - Learning Sciences**

**School of Education, University of Wisconsin Madison, Madison, Wisconsin USA**

*Advisory Board / Research Group member, IES Motion Capture & Geometry Research Group* **Aug. 2016 - Present**

### **Department of Mathematics**

**College of Natural Science, Michigan State University, East Lansing, Michigan USA**

*Graduate Instructor / Graduate Teaching Assistant* **Aug. 2002 - Jul. 2011**  
Duties included full lectureship and administrative responsibilities, fielding of all student inquiries, tutoring all levels of college mathematics at MSU Mathematics Learning Center.

MTH 330 Higher Geometry  
MTH 235 Differential Equations  
MTH 201 Elementary Mathematics for Teachers I  
MTH 202 Elementary Mathematics for Teachers II  
MTH 132 Calculus I  
MTH 124 Survey of Calculus I  
MTH 126 Survey of Calculus II  
MTH 112 Finite Mathematics  
MTH 103 College Algebra

*IREMT Project Aid*

**May 2010 - Jun. 2010**

Duties included creating online exercise resources for NSF-funded project that aims to strengthen the mathematics preparation of K-8 teachers by the continued development of a one-year college course MTH 201, 202 Elementary Mathematics for Teachers I, II taught in a mathematics department.  
www.elementarymathforteachers.com

**School of Mathematical Science, Seoul National University, Seoul, South Korea**

*Graduate Teaching Assistant*

**Mar. 2001 - Jul. 2002**

Duties included shared administrative responsibilities with faculty instructor, fielding of all student inquiries, and running recitations and discussions.

Differential and Integral Calculus I, SS01, SS02

Differential and Integral Calculus II, FS01, US01

**Military Police, Korean Augmentation to the United States Army (KATUSA),  
57th MP Company, 728th Military Police Battalion, Camp Carroll, Weagan, South Korea**

*Sergeant*

**Dec. 1999 - Feb. 2001**

**Seoul National University Middle School, Seoul, South Korea**

*Intern Teacher*

**Mar. 1998 - Aug. 1998**

Teacher Practicum, 8th and 9th grades, Algebra, Geometry, and Statistics

**NoWon Academy (private institute), Seoul, South Korea**

*Instructor*

**Mar. 1997 - Dec. 1998**

High School Mathematics (Algebra, Calculus, Geometry, Probability and Statistics)

## RESEARCH INTERESTS

### **Specific Research Interest**

Conceptual barriers on multiple representations in undergraduate students' geometric and symbolic reasoning; Formation, conversion and treatment Problems of representation systems in the teaching and learning of mathematics; Student conceptual understanding in algebra and geometry; Mathematics and science integration in undergraduate mathematics

### **General Research Interest**

Research in Undergraduate Mathematics Education including Transition from school mathematics to undergraduate mathematics for students; Transitions from undergraduate mathematics to school mathematics for pre-service teachers; Integrated curriculum between mathematics and other subject fields; Integrated curriculum within mathematics; Advanced Mathematical Thinking; Mathematical Knowledge for Teaching; Mathematics Contents for Pre-service Teachers (Elementary/Middle and Secondary)

### **Dissertation Topic**

Conceptualizing Vectors in College Geometry: A New Framework for Analysis of Student Approaches and Difficulties

Dissertation Committee: Prof. Brin Keller (Chair/Advisor), Prof. Glenda Lappan, Prof. Jennifer Kaplan, Prof. Gerald Ludden, Prof. Zhengfang Zhou

TEACHING  
INTERESTS

All levels of undergraduate mathematics/mathematics education courses including Elementary Mathematics/Geometry for Teachers, Capstone in Mathematics (for Secondary), History of Mathematics, College Algebra, Abstract Algebra, Calculus, Real and Complex Analysis, Geometry (Axiomatic and Differential), Linear Algebra, Differential Equations, Discrete Mathematics, Probability and Statistics, Technology in Mathematics Education, Middle School and High School Mathematics

SERVICE

**Math Learning Center Committee**  
Department of Mathematics, University of Wisconsin Madison Sep. 2022 - Present

**Undergrad Program Committee (Early)**  
Department of Mathematics, University of Wisconsin Madison Sep. 2022 - Present

**Math Education Liaison Committee**  
Department of Mathematics, University of Wisconsin Madison Aug. 2011 - Aug. 2022

**Instructional Excellence Program (IEP)**  
Department of Mathematics, University of Wisconsin Madison May 2013 - May 2020

**Committee on Academic Staff Issues and University Staff Issues Committee**  
College of Letters and Science, University of Wisconsin Madison May 2017 - May 2020

**Undergraduate Program Committee (above Calculus)**  
Department of Mathematics, University of Wisconsin Madison Aug. 2018 - May 2019

**TA Evaluation/Policies & Procedures Committee**  
Department of Mathematics, University of Wisconsin Madison May 2013 - May 2018, May 2019 - Aug. 2022

**Math Undergraduate Advising Committee**  
Department of Mathematics, University of Wisconsin Madison Aug 2016 - May 2018

**Undergraduate Program Committee (below Calculus)**  
Department of Mathematics, University of Wisconsin Madison Jan. 2012 - May 2013

**Translator**  
Purple Comet Math Meet International Math Competition  
for middle and high school students Apr. 2013 - 2019

**Faculty and Staff Partner / Project Committee**  
Delta Internship Program, University of Wisconsin Madison Jun. 2014

**International Content Comparison Consultant**  
2015 Korean National Curriculum Reform Project  
Korea Foundation for the Advancement of Science and Creativity  
U.S. AP Calculus AB/BC and Korean High School Calculus Curriculum Mar. 2015 - Apr. 2015

PRESENTATIONS

**A New Classification of Semantic Structures of One-step Word Problem Situations**  
PME-NA 45, Reno, NV: University of Nevada, Oct. 2023

**Math Activity: Chasing Angles for Proof, Embodied Cognition Research colloquia**  
PME-NA 45, Reno, NV: University of Nevada, Oct. 2023

**How Korean Textbooks and Eureka Math Use Representations Involving Fraction Multiplication**  
PME-NA 41, St Louis, MO: University of Missouri, Nov. 2019

**Revisiting Visual Models for Whole Number Division**  
PME-NA 41, St Louis, MO: University of Missouri, Nov. 2019

**Math Activity: Chasing Angles for Proof, Educator Roundtable**

The Future of Embodied Design for Mathematical Imagination and Cognition Workshop, University of Wisconsin - Madison, WI, May, 2019

**Revisiting Area Models for Fraction Multiplication**

PME-NA 39: Synergy at the Crossroads: Future Directions for Theory, Research, and Practice, Indianapolis, Indiana, Oct. 2017

**Training of Graduate Instructors for Math Content Courses: a Case of Math 13x at UW Madison**

Institute of Higher Education Conference, Brookhill Institute of Mathematics, Waukesha, WI, Dec. 9, 2014

**Conceptualizing Vectors in College Geometry: A New Framework for Analysis of Student Approaches and Difficulties**

16th Conference on Research in Undergraduate Mathematics Education, Denver, CO, Feb. 21 - Feb. 23, 2013

**Student Approaches and Difficulties in Understanding and Using Vectors**

14th Conference on Research in Undergraduate Mathematics Education, Portland, Oregon, Feb. 24-27, 2011

**Student Approaches and Difficulties in Understanding and Using Vectors**

MSU Mathematics Learning Research Group, East Lansing, Michigan, Oct. 1, 2010

PROFESSIONAL  
TRAINING AND  
CONFERENCES

PME-NA 45: Engaging All Learners, Reno, Nevada: University of Nevada, Oct. 2023

CoMInDS Summer Workshop, Improving the Preparation of Graduate Students to Teach Undergraduate Mathematics, Physics, and Chemistry on Summer 2023

AP Precalculus Workshop, Cleveland, Ohio, on Nov. 2022

Workshop on Undergraduate Teaching with Mathematics and Statistics Action Technologies, University of North Carolina at Charlotte (Virtual) June 7 - 9, and 16 - 18, 2021

PME-NA 42: Across Cultures, Mazatlan, Mexico, (Virtual) May 27 - June 6, 2021

PME-NA 41: Against A New Horizon, St Louis, MO: University of Missouri, Nov. 2019

The Future of Embodied Design for Mathematical Imagination and Cognition Workshop, University of Wisconsin - Madison, WI, May, 2019

PME-NA 40: Looking Back, Looking Ahead: Celebrating 40 Years, Greenville, SC, Nov. 2018

PME-NA 39: Synergy at the Crossroads: Future Directions for Theory, Research, and Practice, Indianapolis, Indiana, Oct. 2017

PME-NA 38: Sin Fronteras Questioning Borders With(in) Mathematics Education, Tucson, Arizona, Nov. 2016

Critical Issues in Mathematics Education 2016: Observing, Evaluating and Improving Mathematics Teaching from the Early Grades through the University, MSRI, Berkeley, California, Mar. 2016

Institute of Higher Education Conference 2016: Geometry: What's New & Teacher Preparation, Brookhill Institute of Mathematics, Waukesha, WI, Apr. 2016

Institute of Higher Education Conference 2015: The Statistical Education of Teachers (SET), Brookhill Institute of Mathematics, Waukesha, WI, Dec. 2015

AERA 2015 annual meeting, Toward Justice: Culture, Language, and Heritage in Education Re-

search and Praxis, Chicago, IL, Apr. 2015

Critical Issues in Mathematics Education 2015: Developmental Mathematics: For whom? Toward what ends?, MSRI, Berkeley, California, Mar. 2015

Institute of Higher Education Conference 2014: Teacher Preparation in Wisconsin, Brookhill Institute of Mathematics, Waukesha, WI, Dec. 2014

Critical Issues in Mathematics Education 2014: The role of the mathematics department in the mathematical preparation of teachers, MSRI, Berkeley, California, Mar. 2014

45th Wisconsin Mathematics Council Annual Conference, Green Lake, Wisconsin, May 2013

Critical Issues in Mathematics Education 2013: Assessment of Mathematical Proficiencies in the Age of the Common Core, MSRI, Berkeley, California, Apr. 2013

Thirteenth Conference on Research in Undergraduate Mathematics Education, Raleigh, North Carolina, Feb. 2010

The Michigan Section of the Mathematical Association of America And MichMATYC 85th Annual Meeting, Central Michigan State University, Michigan, May. 2009

MSU TAP Workshop, "Discussions that Work: Engaging Students, and Getting Them to Engage One Another", Michigan State University, Apr. 2009

2004 Clay Mathematics Institute Summer School, Floer Homology, Gauge Theory, and Low Dimensional Topology, Hungary Academy of Science, Budapest, Hungary, Jun. 2004

ACADEMIC  
PUBLICATIONS

Kwon, O. H. (2023). A New Classification of Semantic Structures of One-step Word Problem Situations. In Lamberg, T. & Moss, D. (2023). Proceedings of the forty-fifth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (Vol. 2, pp. 3). University of Nevada, Reno.

Swart, M., Schenck, K., Xia, F., **Kwon, O. H.**, Nathan, M., Vinsonhaler, R., & Walkington, C. (2020). Grounded and Embodied Mathematical Cognition for Intuition and Proof Playing a Motion-Capture Video Game. In Gresalfi, M. and Horn, I. S. (Eds.), The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1 (pp. 175-182). Nashville, Tennessee: International Society of the Learning Sciences.

Swart, M.I., Schenck, K., Xia, F., Kim, D., **Kwon, O. H.**, Nathan, M.J., & Walkington, C. (2020). Embodiment as a Rosetta stone: Collective conjecturing in a multilingual classroom using a motion capture geometry game. PME-NA 42, Nov. 2020 (North American Chapter of the International Group for the Psychology of Mathematics Education)

Swart, M. I., Schenck, K., Xia, F., **Kwon, O. H.**, Nathan, M. J., Vinsonhaler, R., & Walkington, C. (2020). Grounded and embodied mathematical cognition for intuition and proof playing a motion-capture video game. In Ilana Horn & Melissa Gressalfi (Eds.), (pp. xx-xx) Proceedings of the 2020 International Conference of the Learning Sciences. Nashville, TN.

Xia, F., Nathan, M. J., Swart, M. I., Schenck, K. E., & **Kwon, O. H.** (2020). Does Click Matter? The Role of Text and Diagram on Geometric Reasoning and Gesture Production. Presented at the 2020 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Son, J., **Kwon, O.**, & I, J. (2019). How Korean Textbooks and Eureka Math Use Representations Involving Fraction Multiplication. In Otten, S., Candela, A. G., de Araujo, Z., Haines, C., & Munter, C. (2019). Proceedings of the forty-first annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. St Louis, MO: University of Missouri.

Kwon, O. H., Son, J., & I, J. (2019). Revisiting Visual Models for Whole Number Division. In Otten, S., Candela, A. G., de Araujo, Z., Haines, C., & Munter, C. (2019). Proceedings of the forty-first

annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. St Louis, MO: University of Missouri.

Ji-Won Son, SeungJung Jo, **Oh Hoon Kwon**, & Hee-Jeong Kim, (April, 2019). A Comparative Analysis of Proportional Reasoning in U.S. and Korean Mathematics Textbooks. Paper presentation to the 2019 Annual Meeting of the American Educational Research Association, Toronto, ON.

Kwon, Oh Hoon; Son, Ji-Won; and I, Ji Yeong (2019). Revisiting Multiplication Area Models for Whole Numbers, *The Mathematics Enthusiast*: Vol. 16 : No. 1 , Article 17.

Nathan, M. J., Walkington, C., Vinsonhaler, R., Michaelis, J., McGinty, J., Binzak, J. V., & **Kwon, O. H.**, (April, 2018). Embodied account of geometry proof, insight, and intuition among novices, experts, and english language learners. Paper presentation to the 2018 Annual Meeting of the American Educational Research Association, New York, NY.

Kwon, O. H., Son, J. W., & I, Jiyeong (2017). Revisiting Area Models for Fraction Multiplication. In E. Galindo & J. Newton, (Eds.), *Proceedings of the 39th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (p. 331). Indianapolis, IN: Hoosier Association of Mathematics Teacher Educators.

Kwon, O. H. (2013). Conceptualizing Vectors in College Geometry: A New Framework for Analysis of Student Approaches and Difficulties. In Brown, S., Karakok, G., Roh, K. H., and Oertman, M., editors, *Proceedings of the 16th Annual Conference on Research in Undergraduate Mathematics Education*, volume 2, pages 574 - 584. SIGMMA RUME.

Kwon, O. H. (2011). Student approaches and difficulties in understanding and use of vectors. In Brown, S., Larsen, S., Marrongelle, K., and Oertman, M., editors, *Proceedings of the 14th Annual Conference on Research in Undergraduate Mathematics Education*, volume 1, pages 187 - 202. SIGMMA RUME.

#### AWARDS

- Letters&Science Academic Staff Professional Development Grant, College of L&S, UW Madison, May 2016
- CIME Workshop Travel Grant, MSRI, Berkeley, California, Mar. 2016
- Letters&Science Early Career Award, College of L&S, UW Madison, May 2015
- CIME Workshop Travel Grant, MSRI, Berkeley, California, Mar. 2015
- CIME Workshop Travel Grant, MSRI, Berkeley, California, Mar. 2014
- Educational Innovation Grant, University of Wisconsin, Madison, Feb. 2014
- Dissertation Continuation Fellowship, Michigan State University, May 2010
- Herbert T. Graham Scholarship, Michigan State University, Jan. 2008
- Brain Korea 21 fellowship, Seoul National University, Sep. 2001- Feb. 2002
- Army Achievement Medal, U.S. Army. Feb. 2001

#### LANGUAGES

- English, Good Proficiency
- Korean, Native fluency
- French, Reading

#### PROFESSIONAL AFFILIATIONS

- American Mathematical Society, Mathematical Association of America (Aug. 2002 - Present)
- National Council of Teachers of Mathematics (Sep. 2010 - Present)
- Wisconsin Mathematics Council (Sep. 2011 - Present)