

RACHEL A. AYIEKO

CURRICULUM VITAE

I. Professional Preparation and Experience

A. Education

Doctor of Philosophy, Curriculum, Teaching, and Education Policy 2014
(Mathematics Methods), Michigan State University, East Lansing,
Michigan, USA.

Dissertation: *The Influence of Opportunity to Learn to Teach
Mathematics on Pre-service Teachers' Knowledge and Beliefs about
Teaching and Learning Mathematics: A Comparative Study.*

Master of Education (Science), Mathematics Education, Egerton 2005
University, Njoro, Kenya.

Thesis: *Effects of Advance Organizers on Form Three Students' Mathematics Self-concept and Performance in Commercial Arithmetic in Selected Schools in Nakuru District.*

Bachelor of Education (Science), Egerton University Njoro, Kenya. 1993
Areas of Study: *Chemistry, Mathematics, Education.*

B. Work History

Assistant Professor, Department of Leadership and 2014-present
Instruction in Education, Duquesne University, Pittsburgh, PA

Elementary Mathematics Methods Instructor, Department of 2009-2013
Teacher Education Michigan State University, East Lansing, MI

Research Assistant, Michigan State University, East Lansing, MI 2008-2013

Applied Mathematics Instructor (Part time), College of Agriculture 2007-2008
and Technology, Jomo Kenyatta University, Nairobi, Kenya.

Applied Mathematics Lecturer, Kinyanjui Technical Training 2005-2008
Institute, Nairobi, Kenya.

Applied Mathematics Lecturer, Rift Valley Institute of Science and 2004-2005
Technology, Nakuru, Kenya.

High School Mathematics and Chemistry Teacher, Kenyatta 1995-2001
Secondary School, Nakuru, Kenya.

High School Mathematics Teacher, Eastleigh High School, Nairobi, 1993-1995
Kenya

C. Professional Memberships

1. Research Organizations
 - a. American Education Research Association (AERA)
 - b. Comparative and International Education Society (CIES)
2. Professional/ Disciplinary Organizations
 - a. Pennsylvania Council of Teachers of Mathematics (PCTM)
 - b. Pennsylvania Association of Mathematics Teacher Educators (PAMTE)
 - c. TODOS: Mathematics for All Excellence and Equity in Mathematics
 - d. National Council of Teachers of Mathematics (NCTM)
 - e. Association of Mathematics Teacher Educators (AMTE)
 - f. Association of Teacher Educators (ATE)

II. Teaching

A. Courses taught

LTEC 322	Pedagogy for numeracy PK-4	8 semesters
LTML 412	Mathematics Content Knowledge for Teaching Grades 4-8	4 semesters
EDLS 341/GSCE 635	Teaching secondary mathematics	4 semesters

B. Academic Advisement

Chair	Elif Gokbel-Dissertation committee	Ongoing
Chair	Bryan Nelson- Dissertation committee	Ongoing
Member	Ahmet Akcay-Dissertation committee	Completed Summer 2016
Member	Ufuk Guven-Dissertation committee	Completed

C. Presentations pertaining to teaching

Aydarova, O., Marquardt, S., Roue, B., **Ayieko, R.** and Ibourk, A. (2016). *Internationalizing teacher education: Creating curriculum spaces for global content*. Workshop organized during Comparative and International Education Society (CIES) Annual Meeting in March, Vancouver, BC.

D. Faculty Development in Teaching

1. Center for Teaching Excellence, Duquesne University
 - a. Inspired teaching retreat- May 2016
 - b. Exploring race and pedagogy at our predominantly white university February, 2016
 - c. SOTL through the lens of IRB-September, 2015
 - d. Those who do the work, do the learning: Actively engaging students in flex classrooms -September-2015
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- e. The Teacher- Scholar Nexus: Through a Spiritan Prism – February 2015
 - f. SES wrapper 2017
 - g. Transformation through the Teacher-Scholar nexus
2. Educational Technology, Duquesne University
 - a. Blackboard basics (online modules)
 - b. Presenting with Prezi
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E. Other activities related to teaching

1. *Facilitator*, Dr. Barbara Sizemore Urban Education Conference, May 2017. Increase Awareness... Give a Voice... Create Possibilities... Workshop title: *Using Identity and Agency to Frame Access and Equity*.
2. *Facilitator*, Dr. Barbara Sizemore Urban Education Conference, May 2016. Engage Yourself in STEAM: Science, Technology, Engineering, Art and Math. Workshop Title: *Creating a Growth Mindset for Learning Mathematics*.
3. *Facilitator*, Dr. Barbara Sizemore Urban Education Conference, May 2015. The Right to an Excellent Education for all Children: Do we Have the Will? Workshop Title: *What does it mean to Teach Mathematics for All?*

III. Scholarship

A. Scholarly publications

- Ayieko, R.**, Kanyongo, G., & Nelson, B. (2018). Understanding the relationships between teacher quality and sixth grade students' mathematics competencies in Kenya and Zimbabwe. *Africa Journal of Teacher Education*, 7(1)66-94.
- Lepak, J., Wernet, J. & **Ayieko, R.** (2018). Capturing and characterizing students' strategic algebraic reasoning through cognitively demanding tasks with a focus on representations. *Journal of Mathematical Behavior*. X(X)XX-XX
- Kanyongo, G. & **Ayieko, R. A.** (2017). Hierarchical Linear Modeling of 6th grade students' SES and school factors on mathematics achievement: Case studies of Kenya and Zimbabwe. *African Journal of Research in Mathematics, Science and Technology Education*, 21(2) 187-199.
- Ayieko, R. A.**, Gokbel, E.N., & Akcay, A. O. (2017). Does computer use matter? The influence of computer usage on eighth grade students' mathematics reasoning. *Forum for International Research in Education*, 4(1), 67-87.
- Ayieko, R. A.** Gokbel, E. N. & Akcay, A.O. (2016). Algebra achievement gaps: A comparative study across the states over the years. In M. B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.). *Proceedings of the 38th Annual Meeting of North American Chapter of the International Group for the Psychology of Mathematics Education* (pp.140-147). Tucson AZ, The University of Arizona
- Gokbel, E.N. **Ayieko, R. A.** Akçay, A. O. (2016). Technology professional development: Mathematics teachers in the States. In M. B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.). *Proceedings of the 38th Annual Meeting of North American Chapter of the International Group for the Psychology of Mathematics Education*. (pp.1553). Tucson Arizona, The University of Arizona.

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- Akçay, A.O. **Ayieko, R. A.** Gokbel, E. N. (2016). Teachers report frequent interactions with students to evaluate progress. In M. B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.). *Proceedings of the 38th Annual Meeting of North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1123). Tucson Arizona, The University of Arizona.
- Ayieko, R.A.**, Floden, R.E., Hu, A., Lepak, J., Reinholz, D.L., & Wernet, J. (2012). Transitioning from executing procedures to robust understanding of algebra. In Van Zoest, L.R., Lo, J.-J., & Kratky, J.L. (Eds.) *Proceedings of the 34th Annual Meeting of North American Chapter of the International Group for the Psychology of Mathematics Education*. Kalamazoo, MI: Western Michigan University, 845-848.
- Hu, S., **Ayieko, R. A.**, Floden, R.E., Lepak, J., & Wernet, J. (2012). Robustness criteria as a framework to capture students' algebraic understanding through contextual algebraic tasks. In Van Zoest, L.R., Lo, J.-J., & Kratky, J.L. (Eds.) *Proceedings of the 34th Annual Meeting of North American Chapter of the International Group for the Psychology of Mathematics Education*. Kalamazoo, MI: Western Michigan University, 1004.
- Githua, B.N. & **Nyabwa, R.A.** (2008). Effects of advance organizer strategy during instruction on secondary school students' mathematics achievement in Kenya's Nakuru District. *International Journal of Science and Mathematics Education*, 6(3) 439-475.
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B. Book chapters

- Ayieko, R. A.** (in press). " Perceptions of pre-service teachers and teacher Educators on learning mathematics instruction and relationships to knowledge In M. T. Totto. *Studying the outcomes of teacher education*. Springerlink.
- Ayieko, R. A.** & Kanyongo, G. (2017). Trends in Teacher Quality and Mathematics Competency Levels in Kenya In M. Gatua et al, *Kenyan Education System: Are we preparing students to meet current global needs and challenges?*
- Ayieko, R. A.** (2018). Identifying Tensions and Improving International Mathematics Teacher Educators' Practice through Self-Study In J. K. Ritter, M. Lunenberg, K. Pithouse-Morgan, A. P. Samaras, & E. Vanassche (Eds.), *Teaching, learning, and enacting of self-study methodology: Unraveling a complex interplay*. Springer
- Ritter, J. K., **Ayieko, R. A.**, Chao, X., Khalil, O., Mahalingappa, L., Meidl, C. J., Meyer, C. K., Quiñones, S., & Williams, J. A. (2018). Insight gleaned from our participation in a faculty self-study learning group. In J. K. Ritter, M. Lunenberg, K. Pithouse-Morgan, A. P. Samaras, & E. Vanassche (Eds.), *Teaching, learning, and enacting of self-study methodology: Unraveling a complex interplay*. Springer
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C. Grants awarded

- Ayieko, R.A.** & Kanyongo, G. (2016). The Influence of Teacher Quality on Sixth Grade Students' Mathematics Competency: A Case Study of Kenya and Zimbabwe (Vol. \$6,000). Duquesne University's Loogman Faculty Research Grant. (PI).

Lovelace, T. S. & **Ayieko, R. A.** (2015) Youth Leading Change: The Role of Critical Citizenship and Youth Voice to Ignite Educational and Community Reform. (Vol. \$25,000) Pittsburgh, PA: The Grable Foundation. (*co-PI*)

Ayieko, R. A. (2013). American Education Research Association (AERA) dissertation grant: AERA Grants Program Award in conjunction with the National Science Foundation for research using large scale NCES data in STEM field (Vol. \$20,000). *PI in this study*

Unfunded

Ayieko, R. A., & Olson, A. Opportunities to Learn Algebra: A comparative study of ten states (Vol. \$35,000) (AERA Research Grants-2015). Proposal revised and resubmitted to AERA Research Grants-2016.

D. Scholarly Presentations

1. International Conference Presentations

Ayieko, R. A., & Kanyongo, G. (2016). Trends in teacher quality and mathematics competency levels in Kenya. Paper presented at the 9th Kenya Scholars and Studies Association (KESSA) in Atlanta, Georgia in September.

Gokbel, E. & **Ayieko, R. A.** (2016). Examining the influence of technology use on students' learning outcomes: Turkey and Singapore. Poster presented at the Comparative and International Education Society (CIES) in Vancouver, Canada in February.

Ayieko, R. A. & Kanyongo, G. (2015). Teacher quality and student Achievement. A comparative study of Kenya and Zimbabwe. Paper presented at the Comparative and International Education Society (CIES) Conference in Washington DC in March (Chair of session)

Ayieko, R.A. & Gokbel, E. (2015). The influence of computer use in learning mathematics: A comparative study. Paper presented at the Comparative and International Education Society (CIES) Conference in Washington DC in March.

Kanyongo, G & **Ayieko, R.A.** (2015). Hierarchical linear modeling of students' SES and school factors on mathematics achievement: A comparative study between Kenya and Zimbabwe. Paper presented at the Comparative and International Education Society (CIES) Conference in Washington DC In March.

Ayieko, R.A. (2013). Opportunity to learn how to plan instruction and teacher knowledge and beliefs about teaching and learning: A comparative study. Paper presented at the Comparative and International Education Society (CIES) Conference in New Orleans on 13th March.

Ayieko, R.A. (2012). Factors influencing student achievement in eighth grade algebra: A comparative study of Botswana, Singapore, and the United States. Presented at the Comparative and International Education Society (CIES) Conference in Puerto Rico on 26th April.

2. National Conference presentations

Ritter, J. K., **Ayieko R. A.**, Chao, X., Mahalingappa, L., Meidl, C. J., Meyer, C. K., Quiñones, S., & Williams, J. A. (2018). Learning to do self-study: An inquiry into the experiences of faculty participants in a self-study learning group. Paper to be presented at the annual meeting of the American Educational Research Association, New York, NY.

Ayieko, R. A. (2016). The relationship between opportunities to learn algebra and students' algebra achievement. A comparative study. Poster presented at the American Education Research Association (AERA) in Washington DC in April.

Ayieko, R. A. & Moreano, G. V. (2016). Mathematics teacher practices and students' academic achievement in Minnesota. A study based on TIMSS. Poster presented at the American Education Research Association (AERA) in Washington DC in April.

Ayieko, R.A. (2015). Opportunities to Learn to Plan Mathematics Instruction for Conceptual Understanding for AERA 2015 Fall Research Conference in October. (*Selected AERA grant awardees*).

Ayieko, R. A. (2014). Opportunity to learn to teach mathematics: A comparative study. Poster presented at the Promising Scholarship in Education: Dissertation Fellows and their Research at the American Education Research Association in Philadelphia on April 6th.

Kuo, N. & **Ayieko, R. A.** (2010). Cheerries, plums and peaches and damsons all have their own beauty and qualities: The emphasis on differentiated instruction in teacher education programs. Presented at the Critical Questions in Education Conference Chicago, IL, on 9th October 2010.

3. Regional Forums and Community-Based Presentations

Ayieko, R.A. (2016). Learning statistics using big data. A possibility for encouraging student voice. Paper presented at the Pennsylvania Council of Teachers of Mathematics (PCTM) in Seven Springs, Pennsylvania in August.

E. Faculty Development in Scholarship

1. Center for Community –Engaged Teaching & Research, Duquesne University
Writing Retreat, June 2015, 2016, 2017
 2. Center for Teaching Excellence, Duquesne University
 - a. *Publish or Perish: Choosing and Approaching Academic Publishers* – November 2015
 - b. *Preparing an Effective Case for Third-Year Review, Promotion, and Tenure*, April 2015 & March 2016
 3. Teacher Education and Development in Mathematics Workshop:
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*Early career scholars workshop on development of TEDS-M manuscripts for
Publication, July 2015*

F. Works in Progress

Ayieko, R. A. (under review). "The relationship between opportunities to learn algebra and students' algebra achievement: A comparative study. *Global Education Review*

Ayieko, R. A. Gokbel, G & Akçay, A. (under review) Building Technology Knowledge in a Secondary Mathematics Methods Course.

Ayieko, R. A. (in progress). "Do Pedagogical Practices Matter in Elementary Mathematics Teacher Preparation? *For the Learning of Mathematics*.

IV. Service

A. University, School, and Department Service

2015 February to April *University:* Service in working group, *Scholarship with Impact*, constituted by the Provost's office. Duties included: Discussing and reporting on "some theme" areas to be included in the strategic plan by Academic Affairs.

2015-date *School:* Member of Academic Curriculum Committee (ACC) in the School of Education. Duties include reviewing proposals for new courses, revision or elimination of courses, and conducting periodic reviews of programs in all departments within the School of Education.

2015-date *Department:* Member of the Doctoral Advisory Committee (DAC). Duties include improvements and expansion of the doctoral program, evaluating comprehensive examinations submitted by the candidates, and reviewing application packets and selection students among prospective students.

PK-4 numeracy block coordinator-Duties include organizing field placement and observations and overseeing the alignment of the four courses: Mathematics pedagogy, mathematics content, mathematics adaptations, and technology in mathematics. Chairing monthly meetings with the instructors to discuss the progress of the courses.

C: Community Service

2015-date Providing professional development to mathematics to teachers in Pittsburgh Urban Christian Center

September 2016-date Providing professional development to mathematics to teachers in Lincoln Elementary School

D. Professional

1. Ad-hoc reviewer for Academic journals, 2014-Current

- a. Mathematics Teacher Educator
- b. Africa Journal of Teacher Education
- c. Global Education Review
- d. Teaching Children Mathematics
- e. Teacher educator
- f. Mathematics Teacher Education and Development

2. Ad-hoc reviewer for Book

Guiding Children's Learning of Mathematics by Tipps, Johnson and Kennedy

3. Service for Academic Conferences

- a. Association of Mathematics Teacher Educators (AMTE)-proposal reviewer
 - b. National Council of Teachers of Mathematics (NCTM)-proposal reviewer
 - c. American Education Research Association (AERA)-proposal reviewer
 - d. Comparative and International Education Society (CIES)-proposal reviewer
 - e. Chair at CIES -2015 session
 - f. Castle conference-2017-proposal reviewer
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