

A K-16 Professional Development Partnership for Teachers of Mathematics:

The Case of LPS and UNL

Guiding Principles for School Mathematics: Professionalism

Professionalism. In an excellent mathematics program, educators hold themselves and their colleagues accountable for the mathematical success of every student and for their personal and collective professional growth toward effective teaching and learning of mathematics.



NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM.

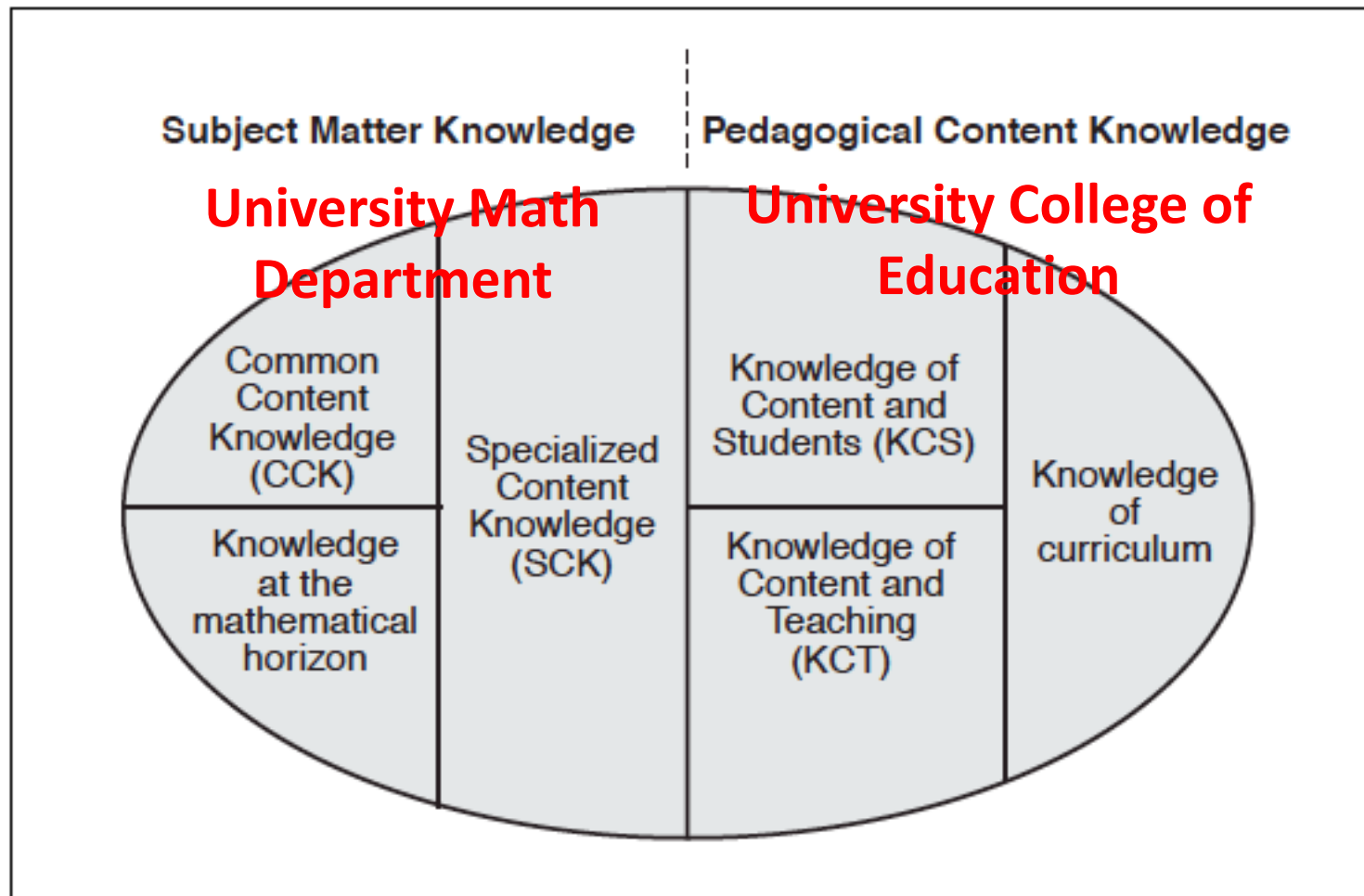
Professional Development for Teachers of Mathematics

- Teachers' mathematical knowledge and their capacity to use it in practice
- Teachers' capacity to notice, analyze, and respond to students' thinking
- Teachers' beliefs and dispositions to foster their continued learning
- Teachers' collegial relationships and learning structures that can support their learning



NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM.

Mathematical Knowledge for



Hill, H. C., Ball, D. L., & Schilling, S. G. (2008). Unpacking pedagogical content knowledge: Conceptualizing and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education*, 39(4), 372-400.

History

- Began in 1999 with a “Calculus Course for High School Teachers.”
- “Geometry for Elementary Teachers” taught by Michelle Homp.
- This led to Math in the Middle
- Nebraska Math (Primarily Math, New Teacher Network, and NebraskaAlgebra)
- NebraskaNOYCE

Outcomes

- Nearly 300 LPS teachers have participated in partnership programs.
- LPS math achievement, as measured by NeSA-M, is at an all time high at the elementary, middle, and high school levels.
- LPS participants are now co-teachers in UNL courses.

Outcomes

- LPS now funds, at the urging of LPS principals, additional cohorts of Primarily Math and Math in the Middle Teachers (80 more teachers).
- LPS participants have become district teacher-leaders and recognized national math education leaders (NCTM Committee Members).
- LPS was selected by IES for inclusion in a research monograph on what works to improve student mathematics achievement, with an emphasis on our professional development program/partnership.

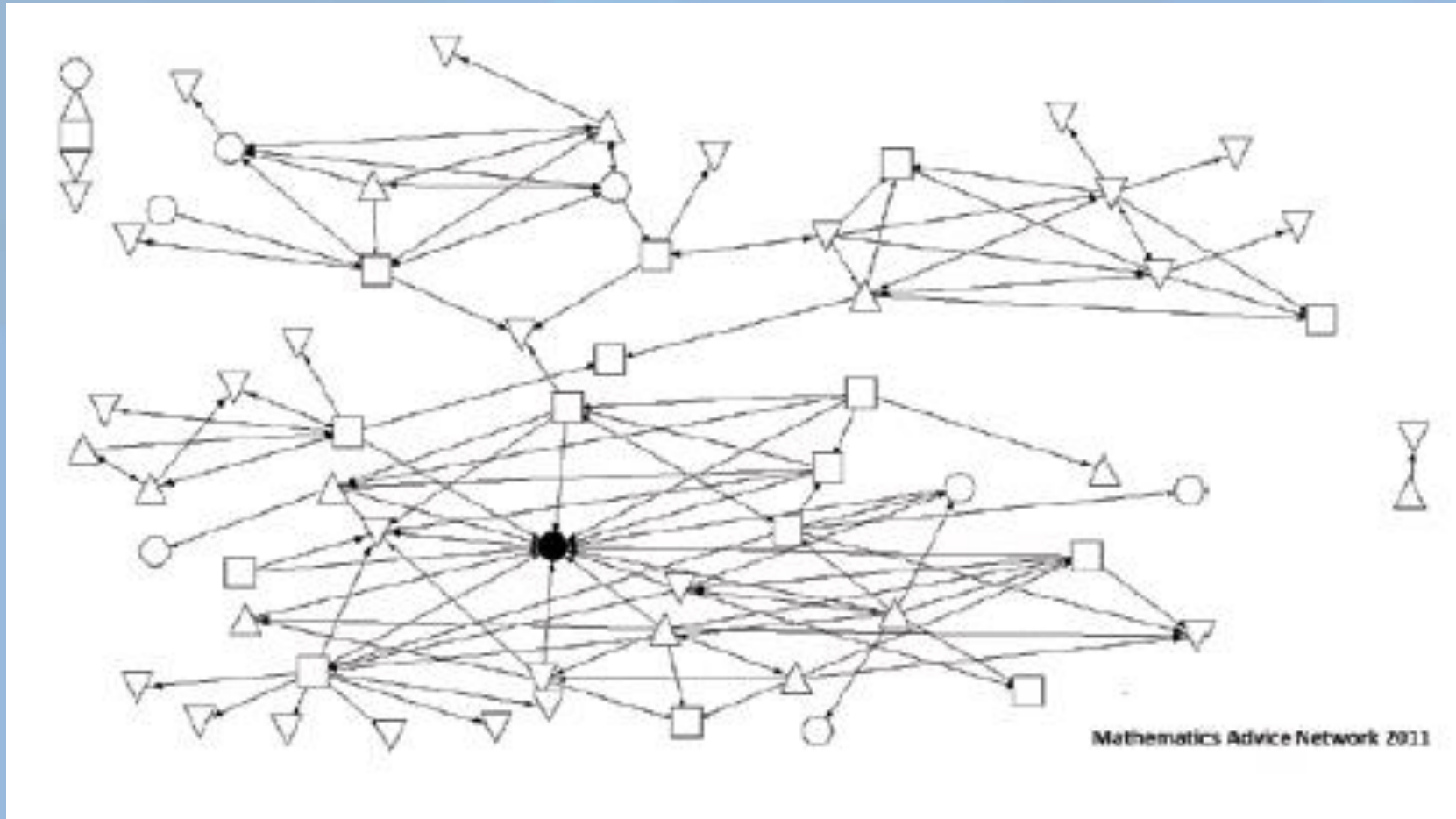
Lessons Learned

- Each institution has its own “culture” and norms of practice.
- Partnerships therefore take time to develop – trust and respect must be earned – “cultures have to be bridged.”
- Each institution has expertise from which the other benefits.
- There is no substitute for “mathematical knowledge for teaching.”

Lessons Learned

- Intense investment in a relatively small number of teachers can impact a large number of teachers if strong PLC/coaching structures are in place, i.e. “structures that support teachers learning” must be in place at the school district level.

The Impact of Intense Investment



Zuspan, T. (2013). From teaching to coaching. *Teaching Children Mathematics*, 20(3), 154-161.

The Bottom Line

- **Effective professional development programs for teachers of mathematics require partnerships to maximize effectiveness.**
 - **The mathematics department brings the subject matter knowledge to the partnership.**
 - **The college of education brings the pedagogical content knowledge to the partnership.**
 - **The school district puts the structures in place for the “distribution” and “implementation” of teachers’ learning.**