My name is Dr. Karl Kosko and I am writing in opposition to specific language in HB 33 on page 1356 line 41663. This language changes current licensure for elementary teachers from PreK-5 to PreK-8. As a former classroom teacher and current mathematics teacher educator and educational researcher, I strongly oppose this change.

Teachers working in grades 6 and above need content specialization to adequately teach the content. For example, to teach middle school mathematics (grades 6-8) teachers need a solid understanding of formal Algebra and Trigonometry. There is also a shift in focus on number systems (Irrational Numbers and Real Numbers, in particular). Teachers need knowledge of this content beyond the grade level they teach, so they understand what underlying concepts students must master at earlier grades. There is ample research to support my statements. Notably, for grades 6-8, teachers with math specific certification have higher student math scores than teachers with general elementary certification (Coenen et al., 2017). There is also strong evidence that teachers' knowledge of mathematics is strongly associated with their students' (Copur-Gencturk, 2022; Hill, 2010; Jacobsen et al., 2011).

The current PreK-5 certification covers ages 3-11 (8 years of development). A 6-12 certification covers fewer years of development than our current PreK-5. Adding grades 6-8 to the elementary certification would significantly reduce the ability to adequately prepare future teachers in terms of knowledge of the content they teach, knowledge of age appropriate instruction, and logistics of preparing future teachers for teaching grades PreK-8. For mathematics, PreK-5 certification involves learning about how children shift from learning to count by 1s, to counting by other numbers (2s, 5s, 10s), integrating place value to do basic arithmetic, learn multiplication/division, learn fractions and decimals and basic operations amongst these. By contrast, Grades 6-8 is when formal algebra is introduced, early trigonometry concepts take shape, and negative and irrational numbers are learned. These latter topics require an significantly greater depth of mathematical knowledge that cannot be obtained when being certified to teach not only mathematics but also literacy, social studies, and science. It is logistically impossible for a standard K-8 degree to cover such concepts and the pedagogy associated.

I take this stance as someone who had a K-8 elementary degree in my Bachelors, while also having a minor in mathematics, from a very good university. I taught 7th grade and was hired because of my strong mathematical background. My undergraduate degree was unable to provide the depth of teaching knowledge for teaching middle grades. Now, as a faculty member at one of the best teacher preparation programs in the world (Kent State University), I have even stronger opposition to a K-8 (or preK-8) certification. Not only is there inadequate ability to provide the content background for future teachers with such a wide range of certification, it is difficult to provide adequate field experience for such a wide range. We know from research that experience within particular grade-levels leads to better teaching (Herbst & Kosko, 2014; Ko & Herbst, 2020; Zolfaghari et al., 2022), and thus better learning of math by students. At Kent State, we have more field hours than any other teacher licensure institute in the state, and perhaps the country. We purposefully provide a wide range of placements across PreK-5, with the total hours being slightly more than a full year of teaching. Adding additional grade levels to the licensure would cripple our ability to provide adequate field experiences to prepare teachers.

Changes to licensure on line 41663 on page 1356 for HB 33 should NOT adjust elementary licensure to include middle grades (6-8). Doing so imposes logistical demands that are impossible for teachers or teacher educators to meet for a 4 year degree (but perhaps for a 7 year degree). Given my 20+ years of experience in education across four states, and my expertise in large scale assessments of mathematics, I predict changing licensure from PreK-5 to PreK-8 will yield the following results:

- A decrease in undergraduate students preparing to become elementary teachers.
- A decrease in the quality of teachers in the elementary grades.
- A decrease in the number of in-state elementary teachers available to hire for full time positions.
- A decrease in mathematics achievement scores.
- An increase in frustrations from parents, teachers, and administrators.

Given my background as a teacher, a teacher educator, a mathematics education researcher, and expert on educational statistics and measurement, I STRONGLY oppose changing from PreK-5 to PreK-8 certification.

Sincerely,

Karl W. Kosko
Professor in Mathematics Education
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