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**Excellence in Physics Education Award Talk: Development of research-based and research-validated curriculum by the Physics Education Group at the University of Washington<sup>1</sup>**

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The Physics Education Group at the University of Washington has been conducting research on the learning and teaching of physics and developing research-based and research-validated curriculum since the mid 1970s. During all of this time, the group has been deeply involved in preparing K-12 teachers to teach physics and physical science by inquiry.<sup>2</sup> For almost 20 years, the group has also been engaged in a major effort to improve the effectiveness of instruction in introductory physics.<sup>3</sup> More recently, the group's work has expanded to include topics beyond the introductory level (*e.g.*, thermal physics, special relativity, and quantum mechanics). The effectiveness of instructional materials produced by the group is assessed at the University of Washington and at other institutions in the U.S. and abroad. Modifications are based on ongoing research. The curriculum has greatly benefited from the contributions of many faculty, post-docs, and graduate students. Other factors that have proved critical for successful adoption have been continuing collaborations and support for faculty at other institutions. The history and overall design of the instructional materials will be illustrated in the context of specific examples that highlight important aspects of their development.

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<sup>2</sup>L.C. McDermott and the Physics Education Group at the University of Washington, *Physics by Inquiry*, John Wiley & Sons (1996).

<sup>3</sup>L.C. McDermott, P.S. Shaffer, and the Physics Education Group at the University of Washington, *Tutorials in Introductory Physics*, Prentice Hall (2002).