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Guest Editors' Introduction: Special Issue on Technology-Supported Problem-based Learning in Teacher Education

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THE INTERDISCIPLINARY JOURNAL OF PROBLEM-BASED LEARNING

GUEST EDITORS' INTRODUCTION

Technology-supported Problem-based Learning in Teacher Education

Thomas Brush (Indiana University) and John Saye (Auburn University)

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Welcome to this special issue of the *Interdisciplinary Journal of Problem-based Learning*, focusing on research exploring the use of problem-based learning (PBL) in preservice and inservice teacher education. In this issue, we particularly focused on how technology may facilitate integration of PBL within teacher education programs, support teacher professional development, assist faculty with implementing PBL within their teaching methods experiences, and assist preservice teachers with exploring the use of PBL strategies. Although PBL has been widely adopted and researched in numerous K12 settings and content areas (e.g., Brush & Saye, 2008; Sadler, Klosterman, & Topcu, 2011; Simons & Klein, 2007; Wirkala & Kuhn, 2011), there has been little research focusing on methods to prepare both current and future teachers to successfully integrate PBL strategies in their classrooms, and the affordances that technology can provide to facilitate the implementation of PBL by teachers. This content of this special issue hopes to begin to address this gap.

In the call for papers for this special issue, we requested manuscripts that reported research focusing on effective uses of technology to support both preservice and practicing teachers in implementing PBL practices in their current and future classrooms. Using this as the critical criterion for inclusion in the special issue, five papers were selected from an initial pool of 15 proposals. The focus areas of these five papers are quite diverse, which we believe enhances the benefits of this special issue. Content areas represented in these papers include science, mathematics, and history. Populations involved in the five studies range from preservice teachers in “traditional” teacher education programs (Brush & Saye; Cross Francis), to individuals in post-baccalaureate teaching methods experiences (Glazewski, Shuster, Brush, & Ellis), to practicing teachers involved in long-term school-based professional development activities (Ertmer, Schlosser, Clase, & Adedokun), to practicing teachers im-

plementing PBL and inquiry within whole-school initiatives (Ravitz & Blazevski).

The variety of technology resources discussed in the five papers, and their integration into the specific research projects, was equally as diverse as the research topics themselves. Ravitz and Blazevski, for example, reported on the relationship between teachers’ perceived knowledge and perceptions regarding the use of a wide range of online resources to facilitate instruction and their use of PBL strategies in their classrooms. Cross Francis and her colleagues explored how a specific digital tool (TinkerPlots) could assist preservice teachers with mastering statistics concepts. Brush and Saye described a set of digital tools specifically designed to support the particular PBL model they integrate throughout their teacher education program. Thus, how technology is integrated into the various research presented in this special issue can range from very specific tools to very broad explorations of a wide variety of resources. Once again, we see this as a strength of this issue. Technology can be defined in a wide variety of ways, and the multitude of methods in which technology can be used to support PBL is equally as diverse.

One important area for continued research that emerged from the various papers in this issue is the distinction between problem-based learning (which we designate in this issue as PBL) and project-based learning (which we designate as PjBL). Two of the papers in this issue focus on project-based learning, while the other three papers discuss very specific *problem-based* learning models (such as problem-based historical inquiry and socioscientific inquiry). PBL purists may take issue with what appears to be the implied comparability between PBL and PjBL. This appears to be a rising issue as more K–12 institutions gravitate towards project-based learning curricular models such as those implemented by daVinci Schools (2013), New Tech High (2014), and High Tech High (2014). While we view PBL as differ-

ent from PjBL, the two terms have been defined in varied and somewhat contradictory ways that have created a lack of clarity in the field. In our curricular model (Brush & Saye; Saye & Brush, 2004), an authentic problem or central question is the overall focus of a unit. With PjBL, the *project* or activity is the central focus of the unit of instruction (Savery, 2006), which sometimes leads teachers and learners to focus more on creating a “flashy” project without the necessity to provide evidence that the project demonstrates meaningful understanding of substantive, authentic problems.

Similar to our criticism of some PjBL curricula, Barron et al. (1998) dismissed PjBL programs that focus on “doing for the sake of doing,” (p. 273), or “action without appropriate reflection.” (p. 274). They defined worthy projects as ones that integrate “doing with understanding.” Many of the projects they define as “doing with understanding,” we would call problem-based. For Barron and her colleagues, PBL is most meaningfully used when embedded in complex PjBL. Similarly, in social studies, Parker, Mosborg, Bransford, Vye, Wilkerson, and Abbot (2011) have used PjBL to characterize a substantial curriculum project. They note that PjBL is “a broad and often unspecified umbrella term for a wide range of pedagogies” (p. 538). However, they specify that their use of the term refers to rigorous projects in which students engage in inquiry structured around complex, authentic challenges that provide opportunities for students to bridge their own prior informal knowledge with disciplinary, formal and broadly vetted knowledge. Thus, while the distinction between PBL and PjBL is not a focus of this special issue, the conceptualization of “problem-based learning,” “problem-based projects,” and “project-based learning” may warrant further discussion and clarification in a future issue of the journal.

Readers will find a wide range of strategies and models presented in this special issue. However, one overall theme remains constant: What strategies and models help prepare current and future teachers to *effectively* design and implement technology-supported PBL teaching and learning activities? We hope that the papers included in this issue will provide some insight into this question, and generate further research for this important topic.

In conclusion, we would like to thank the authors for their scholarship and hard work in conducting exciting and innovative research that will expand our knowledge of the most effective ways to prepare current and future teachers to implement PBL in their classrooms, and disseminating their research through this special issue. We would also like to personally thank both editors of *IJPBL*, Dr. Michael Grant and Dr. Krista Glazewski, as well as the *IJPBL* editorial assistant, Jiyeon Jung, for their support and valuable assistance in the publication of this issue.

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