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## Research Notes

# Undergraduate business students' perceptions of learning outcomes in problem based and faculty centered courses



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## ABSTRACT

This article compares undergraduate business students' perception of the effectiveness of faculty centric pedagogy and problem based learning (PBL) pedagogy. The 303 participating students had experienced both methodologies. The survey measured the students' perceptions of five learning outcomes: knowledge acquisition, problem solving, critical thinking, teamwork, and self-directed learning. Three areas were measured asking the students to assess their experiences using the rubric's designed by the American Association of Colleges and Universities' Values Project (Sullivan, 2015). The content knowledge gain was measured based on Blooms Taxonomy (Krathwohl, 2002), and the self-directed learning by Knowles definition 1975. The scales were tested for validity and reliability in a pre-test with a different student group. No significant difference based on students' perception of learning outcomes in undergraduate business courses is found between PBL taught classes and faculty lead classes across all five perceptions of learning outcomes. There is also no significant relationship between demographic characteristics of the subjects and learning outcomes. The research results opens the questions the effects of individual course based implementations of PBL, differences in the effects of PBL for undergraduate and graduate students, and the effectiveness of PBL pedagogy in a single course in a degree program.

## 1. Introduction

Management education is often criticized for being disconnected from practice (Smith, 2005). An online survey conducted in 2013 on behalf of the Association of American Colleges and Universities provided a detailed insight in priorities of college graduates from the perspective of employer (Hart Research Associates, 2013). Ninety-three percent of the 318 participating employer agreed, “a candidate's demonstrated capacity to think critically, and solve complex problems is more important than their undergraduate major” (Hart Research Associates, 2013, p. 22). Employees also endorse practices that require students to demonstrate both acquisition of knowledge and its application (Hart Research Associates, 2013). Based on their recommendation, universities should increase emphasis on critical thinking (82% agreement), complex problem solving (81%), written and oral communication (80%), and on the application of knowledge and skills in real world settings (78%) (Hart Research Associates, 2013).

Business schools have responded to these criticisms by implementing more application based pedagogical methods, such as problem based learning (PBL), as a teaching method in addition to faculty centered approaches. According to Smith (2005), PBL is a learner centered pedagogical method which basic process is relatively simple. Teams of students solve realistic unstructured problems from their field of professional practice by defining problems, identifying gaps in their knowledge, collecting relevant information,

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and proposing solutions. PBL's goal is long-term learning that results in behavioral change, not just conceptual mastery (Brownell & Jameson, 2004). The approach emphasizes the practice “of problem solving skills, usually not acquired in traditional college coursework” (Willis, 2002, p. 282), and can “bridge the gap between theory and practice” (Hsieh & Knight, 2008, p. 29).

More than one decade ago, Sherwood (2004) noted, “problem-based learning has great potential for management education” (Sherwood, 2004, p. 536). The professional gains include: the need to have team skills and good team member attitudes, discipline specific knowledge that has outstripped the ability to know it all, requirements of efficiency of organizations within which graduates practice, the presentation of unique and unfamiliar problems, and pressure to solve problems with incomplete or contradictory data (Brownell & Jameson, 2004). Previous research has contributed to understand the positive effects of PBL on these cognitive processes (Hartman, Moberg, & Lambert, 2013). The literature supports that PBL enhances deep learning (Dods, 1997; Gijbels, Dochy, Van den Bossche, & Segers, 2005; Ryan, Dolling, & Barnett, 2004), increases critical thinking and ethical reasoning (Becker, Viljoen, Botma, & Bester, 2003; Kong, Qin, Zhou, Mou, & Gao, 2014), improves self-directed and independent learning (Kong et al., 2014), improves teamwork, collaboration, understanding of own and other's professional roles (Cook & Moyle, 2002; Cusack and O'Donoghue, 2012; Kong et al., 2014; Sharp & Primrose, 2003; Williams, 1999) and even increases attendance (Creghan & Adair-Creghan, 2015; Lieux, 1996). However, a crucial question is if students actually perceive these gains and agree that PBL has a better way to enhance their professional skills as compared to lecture based courses (Walker & Leary, 2009) that is the core question of this research study. The current study investigates whether students' perceptions of their learning outcomes are more positive in a problem-based learning format class than a traditional faculty lead lecture-based format class. Our findings contribute to the existing knowledge of student-based pedagogy by increasing our understanding of how students perceive the results of their own learning experiences in problem-based learning classes.

## 2. Literature review

The genesis of PBL was famously in the medical field at McMaster University in Canada in the 1960's and spread from there to other medical schools (Klegeris & Hurren, 2011). PBL later was adopted by other professional disciplines such as allied health, engineering, the sciences, and business (Strobel & van Barneveld, 2009). There is a major difference in the implementation of PBL pedagogy in medicine and health related disciplines versus implementation in other disciplines. The health related programs tend to use PBL as the methodology for the entire program as surveys represented in meta-reviews show (e.g. Albanese & Mitchell, 1993; Vernon & Blake, 1993). The other disciplines tend to implement PBL in a course or courses but not usually the entire program, especially not for undergraduates (Chang, 2001; Matthews, 2004; Mitchell, Canavan, & Smith, 2010; Willis, 2002).

Most literature on PBL learning outcomes is available from business programs based on PBL pedagogy mainly at graduate level (e.g. Stinson & Milter, 1996). For undergraduate business programs, research is more limited where we find evaluations of PBL primarily at the single course level (e.g. Bamford, Karjalainen, & Jenavs, 2012; Heagy & Lehmann, 2005; Sherwood, 2004; Stanley & Marsden, 2012). Only one study explicitly compares business programs with one of them entirely PBL taught (Dochy, Segers, Van Den Bossche, & Struyven, 2005).

The current review of the extant literature on the effectiveness of PBL focuses on the five learning outcomes employers have identified as expecting from business students –skill sets: problem solving, critical thinking, knowledge acquisition, teamwork and self-directed learning. The review relied heavily on published meta-analysis of the research (Albanese & Mitchell, 1993; Berkson, 1993; Vernon & Blake, 1993; Colliver, 2000; Dochy, Segers, Van den Bossche, & Gijbels, 2003; Gijbels et al., 2005; Kalaian, Mullan, & Kasim, 1999; Newman, 2003), and on a meta-synthesis by including most of the mentioned meta-analysis (Strobel & van Barneveld, 2009). These meta-analysis are based on research material covering PBL in medical or health education, expect for Dochy et al., 2005, who included a survey in the field of education. None of the meta-analyses report on business program results, as little research has been conducted outside of the medical and education fields (Hmelo-Silver, 2004). The current research contributes to the existing literature by increasing our understanding of how PBL learning goals are achieved across the spectrum of learners in a business program.

### 2.1. Knowledge acquisition

Albanese and Mitchell's (1993) meta-review on the outcomes and implementation issues of PBL included 10 studies in the medical field, published between 1972 and 1992, eight of which examined full-time PBL curricula. These studies all used the National Board Medical Exams 1 (NBME 1, a standardized exam measuring the acquisition of scientific knowledge in the medical field) to measure the effects of knowledge acquisition of PBL compared to lecture based teaching methods. “PBL students scored lower on basic science examinations and viewed themselves less well prepared in the basic sciences in comparison to their conventionally trained counterparts” (Albanese & Mitchell, 1993, p. 58). They concluded that “PBL students might have deficits developing adequate cognitive scaffolding” (Albanese & Mitchell, 1993, p. 61).

Vernon and Blake (1993) looked at 22 studies in the field of medical education. Knowledge acquisition was also measured with NBME 1, and all their data confirm a significant trend favoring traditional teaching methods over PBL methods. However, when other outcome measures were used to test the knowledge acquisition, the trend in favor of traditional teaching was not significant (Vernon & Blake, 1993, p. 556).

Kalaian et al. (1999) also focused on 22 medical education studies from 1970 to 1997 and confirmed, that traditional learning approaches tend to produce better results for basic science knowledge than PBL. Also Colliver's review on the medical field was based on the three meta-analyses of 1993 and other surveys published between 1992 and 1998 (Colliver, 2000, pp. 259–266) indicated that

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