# Students' Perceptions of Problem-Based Learning in Undergraduate Courses

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## Introduction/Need for Research

As times change, students prefer different teaching methods (Hmelo-Silver 2004; McMay, Gradel, & Scott, 2013). They also have to obtain transferable skills, and students must be able to retain knowledge at a higher degree. Problem-based learning (PBL) is a teaching method becoming increasingly popular in multiple disciplines (Hawley et al., 2017; Savery, 2006). PBL is a pedagogy that allows students to guide their learning by solving real-life problems, engaging in critical thinking, applying course content, and working individually and collaboratively for the desired outcome of enhanced understanding (Barrows & Tamblyn, 1980; McMay et al., 2013; Sulaiman, 2010). It has become the preferred method in agricultural science courses, even though they have been implementing PBL due to the nature of the courses (Parr & Edwards, 2004). PBL goes back to the time of Dewey, Aristotle and Socrates. Dewey thought learning should be grounded in experience. Socrates modeled learning through questioning, inquiry, and critical thinking, while Aristotle was a proponent of learning by doing (Felder & Brent, 2016).

The Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) lists critical fundamental skills as well as workplace competencies. These skills and competencies align with PBL and with what students can achieve while participating in a PBL course. Self-management, communication, decision-making, teamwork, professionalism, experiences, and leadership are the repeatedly top-ranked skills employers are looking for when hiring (Rosenberg, Heimler, & Morote, 2012).

## Theoretical framework

PBL is a learner-centered approach that helps students apply knowledge and skills to develop a viable solution as well as to conduct research (Savery, 2006). Hmelo-Silver (2004) states PBL is a way to help students become active learners since it is simulating real-world problems. Elements of PBL are present in several other methods such as active learning, critical thinking, communication skills, creative thinking, and inquiry-based learning (Felder & Brent, 2016; Parr & Edwards, 2004).

According to Parr and Edwards (2004), students learn best when the subject matter is conducive to hands-on experiences. The PBL model (Hmelo-Silver, 2004), shows the steps students go through as they are engaged in PBL. This process allows for an outline of what the student can experience in a PBL course. Savery (2006) compiled a list from both the website for the PBL Initiative and the Southern Illinois University School of Medicine (2017) which includes the necessary steps to classify a lesson as PBL. The list states students must be responsible for their learning; it must be unstructured and allow free inquiry. The list from PBL Initiative and Savery (2006) website goes hand in hand with the PBL cycle by Hmelo-Silver (2004).

## Methodology

The target population for this study included students enrolled in courses at Western Texas College in Snyder, Texas, during the spring semester of 2019. Eight instructors on campus were identified as teaching using the PBL method. The instrument used in this study was developed using three previously designed instruments. The Senocak (2009), Hawley et al. (2017), and Crawford et al. (2011) studies were used to create the complete questionnaire that was given to

the students at the end of the spring 2019 semester. The instrument included four sections with 65 questions rated on a 5-point Likert type scale. Analysis of this research was quantitative in nature examining students' perspectives, demographics, and employability skills.

## Results/Findings

Objective one examined student demographics of those who completed the questionnaire. A majority of the students were female, with 66% ($N$ = 57), while the remaining 34% ($N$ = 29) were male. Sophomores were 55% ($N$ = 47) of the respondents, while freshman were 42% ($N$ =36) and 3% ($N$ =3) were juniors. More than 81% ($N$ = 70) of the students plan to transfer to a university after graduation. The remaining 17% ($N$ = 15) plan on entering the workforce after graduation.

The second objective dealt with the PBL environment. A mean of 3.94 was calculated for the PBL environment meaning that often the students are participating in the 23 items from the Senocak (2009) study. Students' sometimes prepared a portfolio during the course and had the lowest mean of 3.12 ($N$ = 66). When students were given a task, they often ($M$ = 4.43, $N$ = 67) completed all group tasks.

Objective three addressed the seven employability skills employers want. 59 subjects completed this section of the instrument. Communication skills had a mean of 4.26, so students agreed they gained this skill by being in a PBL course. Students' agreed teamwork ($M$ = 4.21), decision-making skills ($M$ = 4.17), leadership ($M$ = 4.17), self-management ($M$ = 4.13), experiences ($M$ = 4.11), and professionalism ($M$ = 4.07), skills were gained.

63 completed the section designed to determine overall perceptions of PBL. The overall grand mean for the students' perceptions of PBL was 4.13. They agreed PBL was beneficial to them. Students agreed most when PBL was used in the course; it made the discussions and the subject matter more relevant and realistic ($M$ = 4.21). The item with the least agreement assessed the degree to which PBL integrated material from the course ($M$ = 4.03).

## Conclusions, Implications & Recommendations

Overall, students preferred the PBL method. Respondents perceived they were able to gain employability skills such as communication, teamwork, and leadership. Professionalism, experience, and self-management skills need to be improved according to the respondents. Students enrolled in PBL courses felt like they did not have an increased understanding or interest in the course material. Students agreed instructors should use the PBL method again. With some adjustments to the courses, students will receive more significant benefits.

Recommendations from the study are instructors who are currently teaching using the PBL method need to improve the PBL environment. Allowing respondents to share their results with group members and conduct evaluations of member's performances would enhance the PBL environment. Solving problems with different solutions would also help. Studies should be done to determine if students are retaining more knowledge when enrolled in a PBL course. Looking at PBL on a broader spectrum would be beneficial to the profession to distinguish if students prefer this method. If the students prefer PBL, then looking at how to encourage and teach the instructors to use this method would be necessary.

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