

# REFLECTING THE TEACHER'S ROLE IN A PROJECT-BASED LEARNING (PBL) CLASSROOM: LESSONS LEARNED FROM STUDENTS

Xiaoxia Wei<sup>1,\*</sup> and Yan Ye<sup>2</sup>

## Abstract

This study aimed to investigate students' expectations for teachers using project-based learning (PBL) in an individual classroom, from a tactical perspective, based upon students' perceptions toward 1) topic choice, 2) teacher's support, 3) evaluation method, and 4) preference for PBL. The Kano model, commonly used to compare the service expectations and performance perceptions of customers in a marketing context, was adopted as the survey instrument to evaluate 152 students' perceptions. The results of the study were as follows. 1) From a tactical level, when conducting PBL, teachers should decide the project topic and evaluation method, and must provide sufficient and detailed assistance to students regarding the project. 2) From a more conceptual level, teachers' domination in areas that are beyond the students' capabilities to make decisions, greatly contributes to students' learning.

Keywords: project-based learning; teacher's role; students' perceptions; Kano model

## 1. INTRODUCTION

Traditional teaching and learning approaches as well as standardized testing systems have gradually failed to comply with the 21<sup>st</sup>-century educational requirements. Regarded as superior to traditional teaching methods, project-based learning (PBL) has gained attention as a teaching methodology that utilizes student-centered projects to facilitate student learning (Holm, 2011; Mergendoller, Maxwell & Bellisimo, 2006).

PBL is an innovative and comprehensive approach to classroom teaching and learning; it is rooted in the work of educator and

philosopher John Dewey (1959). Dewey's philosophy is child-centered and introduces real-life situations and contexts into school settings. Smith and Dodds (as quoted in DeFillippi, 2001) stated that Dewey's philosophy refers to the theory and practice of utilizing real-world work assignments on time-limited projects, to achieve mandated performance objectives and facilitate individual and collective learning.

Several researchers and educational theorists have adopted the principles of PBL as a foundation for related methodologies (Knoll, 1997; Prince & Felder, 2006). They argued that PBL not only helps in developing

---

\*Corresponding author <sup>1</sup>Dr. Xiaoxia Wei obtains a Ph.D. in Educational Leadership from Assumption University, Thailand. Currently she is working as a lecturer in the Business Administration Department of Mahidol University International College, Thailand. She is interested in research areas of business communication, cross-cultural communication, as well as research in both Chinese and English language teaching. E-mail address: xiaoxia.wei@mahidol.edu

<sup>2</sup>Asst. Prof. Dr. Yan Ye obtains a Ph.D. in Educational Leadership from Assumption University, Thailand. Currently she is working as a full-time lecturer and research director in Graduate School of Human Sciences of Assumption University, Thailand. Her research interests are in educational administration, leadership, school management, Chinese and English language teaching.

students' problem solving and higher-order thinking skills (Knoll, 1997; Prince & Felder, 2006; Berends, Boersma, & Weggemann, 2003) but also allows students to learn by doing, and by applying ideas (Krajcik & Blumenfeld, 2006), by engaging in significant self-reflection on their own learning experience (Argyris & Schon, 1974; Raelin, 2000; DeFillippi, 2001). Thomas (2000) enumerated five distinguishing features of PBL: 1) focusing on contents that are central to the PBL curriculum; 2) using projects as the primary vehicle for content learning, with frequent assessments; 3) involving students in ways that require them to identify problems, develop and design solutions, and create an end-product, such as a presentation, report, invention, or model; 4) adopting a student-centered approach to the greatest extent possible; and 5) working on reality-based ideas and problems rather than on academic exercises and pursuits.

The prevalence of PBL not only enriches the pedagogical approaches but also better serves the needs of a wide array of learners whose performance is not considered successful in terms of traditional testing systems. PBL can be effective in meeting the needs of racially diverse learners and those of low-achieving students (Thomas, 2000; Bneke & Ostrosky, 2008; Cheng, Lam, & Chan, 2008; Fillipatou & Kaldi, 2010). Moreover, PBL projects can help students develop various social skills, such as team communication, negotiation, and cooperation (Bell, 2010). PBL also addresses the importance of student voice in the classroom by treating students as knowledge creators, in which students take leading roles in the classroom, but still with active teacher support (Fielding, 2012).

According to Home (2011), the areas of research interest regarding PBL include the following:

- 1) its value and effectiveness by comparing it with the traditional lecture-based instruction from the perspective of students' roles and gains (Baumgartner & Zabin, 2008; Duncan

& Tseng, 2010; Geier et al., 2008; Gultekin, 2005; Kaldi, Fillipatou, & Govaris, 2011; Mergendoller, Maxwell, & Bellisimo, 2006; Tal, Krajcik, & Blumenfeld, 2006);

- 2) students' satisfaction and attitudes (Barron et al., 1998; Baumgartner & Zabin, 2008; Beneke & Ostrosky, 2008; Blumenfeld et al., 1991; Chu, Tse, & Chow, 2011; Faris, 2008; Hertzog, 2007; Hmelo-Silver, 2007);
- 3) its developmental effects on preschool children (Aral et al., 2010; Bicaki & Gursoy, 2010) and diverse learners (Mergendoller & Maxwell, 2006; Tal, Krajcik, & Blumenfeld, 2006); and
- 4) its teacher and setting attributes (Duncan & Tseng, 2010; Beneke & Ostrosky, 2008; Hertzog, 2007; Mergendoller & Maxwell, 2006).

Previous studies on PBL have focused on defining PBL at the strategic level. Few studies have examined how classroom teachers must manage a PBL-centered classroom in terms of management and tactical actions. Given such a gap in the literature, this study aims to determine the ways teachers must carry out PBL in an individual classroom, from a tactical perspective, based upon student perceptions toward topic choice, teacher support, evaluation method, and preference for PBL.

## 2. METHODS

### 2.1 Participants

The participants of this study comprised 152 students taking a business communication course, one of the core courses of the business administration program at an international college in Thailand. In order to help students apply theoretical knowledge regarding communication in a practical business context, a business project was given to students, in which they were to determine business administrators' attitudes towards business communication skills in Thailand.

Students needed to clarify the project objectives, collect data via interviews and questionnaires, and analyse the data to make recommendations. By the end of the trimester, students' perceptions and reflections on their experiences throughout conduction of the entire project were collected and analysed.

## 2.2 Ethical Considerations

The following measures were taken to avoid ethical issues during the data-collection process:

1. The data were collected at the end of the trimester; students had finished all content included in the course and grades had been given;
2. The teacher gave clear instructions and explanations before distributing the questionnaires;
3. The teacher informed the students that their participation was voluntary;
4. The students' answers were anonymous;
5. The students were given enough time to respond to the questions; and
6. The teacher was absent when students were giving answers.

## 2.3 Research Design

This study aimed to investigate students' expectations for teachers using project-based learning (PBL) in an individual classroom. The Kano Model was therefore adopted, as the survey instrument to evaluate students' perceptions toward the four tactical aspects (i.e., topic choice, teacher's support, evaluation method, and preference for PBL) in performing PBL in an individual classroom.

### 2.3.1 Kano model

The Kano model is used commonly in the marketing context, in which it compares the service expectations and perceived performance of customers (Chen & Kuo, 2011). According to Matzler and Hinterhuber (1998) and Shen, Tan, and Xie (2000), as both

a conceptual model and a survey instrument, the Kano model has proved to be effective in determining the characteristics of quality service.

In the model, questionnaires containing both **positive (functional)** and **negative (dysfunctional)** questions are conducted to collect the satisfaction difference per item from each of the participants, and to judge each item's quality characteristic, as represented according to 'Kano's evaluation form' (Table 1) proposed by Kano, Seraku, & Tsuji (1984).

As shown in Table 1, the quality of a product or service can be evaluated in terms of five attributes as follows:

- 1) **Attractive quality (A)** provides satisfaction when achieved fully, but does not cause dissatisfaction when not fulfilled. These attributes are neither explicitly expected nor expected by the customer.
- 2) **One-dimensional quality (O)** results in satisfaction when fulfilled and dissatisfaction when not fulfilled. Customer's satisfaction is proportional to the level of fulfilment: the higher the level of fulfilment, the higher the customer's satisfaction, and vice versa.
- 3) **Must-be quality (M)** refers to the requirements that the customers expect and are taken for granted. When a service is performed well, customers are only neutral; however, when it is performed poorly, customers are extremely dissatisfied. This is, therefore, the basic criteria of a product/service.
- 4) **Indifferent quality (I)** refers to aspects that are neither good nor bad, and they do not result in either customer satisfaction or dissatisfaction.
- 5) **Reverse quality (R)** refers to attributes whose presence causes customer dissatisfaction, and whose absence results in customer satisfaction
- 6) **Questionable answer (Q)** refers to cases like wrong answers, no answers, unclear answers, etc.

**Table 1. Kano's Evaluation Form**

Customer requirements		Dysfunctional				
Functional		I like it.	I expect it.	I am neutral.	I can tolerate it.	I dislike it.
	I like it.	Questionable	Attractive	Attractive	Attractive	One-dimensional
	I expect it.	Reverse	Indifferent	Indifferent	Indifferent	Must-be
	I am neutral.	Reverse	Indifferent	Indifferent	Indifferent	Must-be
	I can tolerate it.	Reverse	Indifferent	Indifferent	Indifferent	Must-be
	I dislike it.	Reverse	Reverse	Reverse	Reverse	Questionable

**2.3.2 Procedures**

The procedure of Kano's model classifies each of the quality items into one of the categories based upon most of the responses. The detailed procedure was conducted according to the following steps:

- (1) Gather a list of key features of the project that the researcher would like to test.
- (2) Write two questions for each key feature to eliminate any bias response or inconsistency.
  - (a) The first question (positive question) determines how a student feels if the project has this feature.
  - (b) The second question determines how a customer feels if the project does not have this feature.
- (3) Prepare the Kano survey questions (Table 2).
  - (a) Suppose the student says he/she feels that he/she likes the assigned

topic (answer 1 in positive question) and he/she dislikes it if no assigned topic (answer 5 in negative question), this requirement will fall into 'one-dimensional' quality (see Table 1).

- (b) The negative question in a Kano questionnaire serves as a consistency check. A combination of two questions for each feature helps to determine the type of quality.
- (4) Tally the results to determine how the majority of students express their satisfaction toward the key features of the project. Determine which features of the project meet students' satisfaction. For instance, Feature 1 is a 'must-be' requirement because it obtained the highest vote among the students (see Table 3).

**Table 2. Kano Survey Question**

If you <b>are</b> given an assigned topic by the teacher, how do you feel? Positive question (functional)	(1) I like it. (2) I expect it. (3) I am neutral. (4) I can tolerate it. (5) I dislike it.
If you <b>are not</b> given an assigned topic by the teacher, how do you feel? Negative question (dysfunctional)	(1) I like it. (2) I expect it. (3) I am neutral. (4) I can tolerate it. (5) I dislike it.

**Table 3. Tally of Results of the Kano Survey Questionnaire Distributed among 152 Students**

	M	O	A	I	R	Q	
Feature 1	<b>56</b>	35	8	3	0	0	M
Feature 2	30	<b>63</b>	2	14	0	1	O
Feature 3	25	20	<b>45</b>	9	0	0	A
Feature 4	12	<b>56</b>	17	10	2	2	O

**Table 4. Perception toward Project-Based Learning (PBL) among 152 Students**

Features			M	O	A	I	R	Q
Topic choice		Assigned topic	6	9	15	<u>108</u>	14	0
Teacher' support	Timing	Give support in advance	10	59	<u>63</u>	20	0	0
		Give support when needed	9	62	<u>64</u>	17	0	0
	Quantity	Give detailed information	15	<u>57</u>	51	27	1	1
Evaluation method		Evaluation method (using portfolio)	8	6	10	<u>117</u>	9	2
Preference for PBL		Preference for a project	2	8	32	<u>97</u>	13	0

### 3. RESULTS

Table 4 presents the students perceptions toward topic choice, teacher support, evaluation method, and preference for PBL from a tactical perspective.

#### *Topic choice*

The number of participants' perceptions toward 'topic choice' stood at 108, which is the outstanding feature of indifferent quality (I), which indicates that this aspect is neither good nor bad, and it does not result in either participants' satisfaction or dissatisfaction.

#### *Teacher support*

In terms of when to offer support, either in advance (63) or when needed (64) falls into the category of attractive quality (A); which means the participants were satisfied when support was given, but they were not dissatisfied when the former were not

fulfilled. However, the participants did care about the quantity of the information given, as this feature fell into the category of one-dimensional quality (O), that is, the more detailed the information given, the more satisfied the students were; and vice versa.

#### *Evaluation method and Preference for PBL*

'Evaluation method and 'preference for a project' are neither good nor bad based on the participants' perceptions, as both of the numbers, 117 and 97, respectively, entail an indifferent quality (I); thus, these attributes did not result in either satisfaction or dissatisfaction of the participants.

### 4. DISCUSSION AND CONCLUSION

This study aimed to offer practical suggestions to teachers regarding ways to perform PBL in individual classrooms, based upon students' perceptions toward the project

conducted in a business course from a tactical perspective.

The results of this study show that students do not indicate a strong preference for topic choice or evaluation method (either being evaluated by process or final product) as these features both entail an indifferent quality. Moreover, students are also seemingly uninterested in whether they are requested to conduct any tasks in the form of a project. However, they do indicate a strong desire for teachers' support, regardless of timing; the more detailed the information, which is provided to them, the more helpful they find it.

The results of this study highlight and also support the significant value of the teacher's role in the classroom, when the mainstream of education focuses upon students' voice. However, the purpose of this study is not to challenge this trend, but to work as a clear reminder of the importance of the teacher's role in the classroom, for all practitioners in the educational field at all levels. Even though it is significant for students/learners to become the center of the classroom, professional educators should understand that the teacher's role might be more important than merely working as resources, facilitators, or guides, from the students' perspective. On the one hand, students might desire greater support from their teachers to help them achieve the learning goals; on the other hand, teachers should also dominate in areas in which students are not interested or not trained, such as choosing the topics for projects and methods for their evaluation.

It is hoped that teachers might take two suggestions into consideration if they are interested in performing PLB in their classroom practice. First, from a tactical level, when conducting PBL, teachers should decide the project topic and evaluation method, and provide sufficient and detailed assistance to students. Second, from a more conceptual level, teachers should dominate in areas that are beyond the students' capabilities to make decisions, as this would greatly contribute to

students' learning. For instance, a teacher cannot allow immature primary students, or even undergraduates, to decide what kind of project will benefit them or the methods that will be used to evaluate them. Future studies are suggested to investigate students' perceptions towards teachers' roles in PBL at different levels, as this study was conducted only at the tertiary level.

## REFERENCES

- Aral, N., Kandir, A., Ayhan, A. B., & Yaşar, M. C. (2010). The Influence of Project-based Curricula on Six-year-old Preschoolers' Conceptual Development. *Social Behavior and Personality: An International Journal*, 38 (8): 1073–1079. doi:10.2224/sbp.2010.38.8.1073.
- Argyris, C., & Schon, D. A. (1974). *Theory to Practice: Increasing Professional Effectiveness*. San Francisco: Jossey-Bass.
- Barron, B., Schwartz, D., Vye, N., Moore, A., Petrosino, A., Zech, L., Bransford, J., & the Cognition and Technology Group at Vanderbilt University. (1998). Doing with Understanding: Lessons from Research on Problem- and Project-based Learning. *The Journal of the Learning Sciences*, 7 (3&4): 271–311.
- Baumgartner, E., & Zabin, C. (2008). A Case Study of Project-based Instruction in the Ninth Grade: A Semester-long Study of Intertidal Biodiversity. *Environmental Education Research*, 14 (2): 97–114. doi:10.1080/13504620801951640.
- Bell, S. (2010). Project-based Learning for the 21st Century: Skills for the Future. *The Clearing House: A Journal of Educational Strategies, Issues, and Ideas*, 83: 39–43.
- Beneke, S., & Ostrosky, M. M. (2008). Teachers' Views of the Efficacy of Incorporating the Project Approach into Classroom Practice with Diverse Learners. *Young Children*, 11 (1): 1–9. Accessed 30 Jan 2016. <http://ecrp.uiuc.edu/v11n1/ostrosky.html>

- Berends, H., Boersma, K., & Weggeman, M. (2003). The Structuration of Organizational Learning. *Human Relations*, 56 (9): 1035–1056.
- Bicaki, M., & Gursoy, F. (2010). A study on the Effectiveness of Project-based Education. *International Journal of Academic Research*, 2 (5): 379–388.
- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Gudzial, M., & Palinscar, A. (1991). Motivating Project-based Learning: Sustaining the Doing, Supporting the Learning. *Educational Psychologist*, 26 (3&4): 369–398.
- Chen, L. H. & Kuo, Y. F. (2011). Understanding e-learning service quality of a commercial bank by using Kano's model. *Total Quality Management & Business Excellence*, 22 (1): 99-116.
- Cheng, W. Y., Lam, S. F., & Chan, C. Y. (2008). When High Achievers and Low Achievers Work in the Same Group: The Roles of Group Heterogeneity and Processes in Project-based Learning. *British Journal of Educational Psychology*, 78 (2): 205–221. doi:10.1348/000709907X218160.
- Chu, S.K.W. & Tse, S.K. & Chow, K. (2011). Using Collaborative Teaching and Inquiry Project-Based Learning to Help Primary Students Develop Information Literacy and Information Skills. *Library and Information Science Research*, 33: 132-143
- Dewey, J. (1959). *Dewey on Education*. New York: Teachers College Press.
- DeFillippi, R. J. (2001). Introduction: Project-based Learning, Reflective Practices and Learning Outcomes. *Management Learning*, 32 (1): 5-10.
- Duncan, R. & Tseng, K. A. (2010). Designing Project-based instruction to foster generative and mechanistic understandings in genetics. *Journal of Research in Science Teaching*, 45(8): 922-939.
- Faris, A. (2008). The Impact of Project-Based Learning on the Students' Attitudes towards Science among Ninegraders in Hamza Independent School. *Analysis*, 1-8
- Fielding, M. (2012). Student Voice: Patterns of Partnership and the Demands of Deep Democracy. *Connect*, 197: 10-15.
- Fillipatou, D., & Kaldi, S. (2010). The Effectiveness of Project-based Learning on Pupils with Learning Difficulties Regarding Academic Performance, Group Work, and Motivation. *International Journal of Special Education*, 25 (1): 17–26.
- Geier, R., Blumenfeld, P. C., Marx, R. W., Krajcik, J. S., Fishman, B., Soloway, E., et al. (2008). Standardized Test Outcomes for Students Engaged in Inquiry-Based Science Curricula in the Context of Urban Reform. *Journal of Research in Science Teaching*, 45(8): 922-939. doi: 10.1002/tea.20248.
- Gultekin, M. (2005). The Effect of Project Based Learning on Learning Outcomes in the 5th Grade Social Studies Course in Primary Education. *Educational Sciences, Theory and Practice*, 5(November): 548-557.
- Hertzog, B. (2007). Transporting Pedagogy: Implementing the Project Approach in Two First-Grade Classrooms. *Journal of Advanced Academics*, 18(4): 530-564.
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and Achievement in Problem-Based and Inquiry Learning: A Response to Kirschner, Sweller, and Clark (2006). *Response*, 42(2): 99-107.
- Holm, M. (2011). Project-based Instruction: A Review of the Literature on Effectiveness in Prekindergarten through 12th Grade Classrooms. *InSight: Rivier Academic Journal*, 7 (2): 1–13.
- Kaldi, S., Filippatou, D., & Govaris, C. (2011). Project Based Learning in Primary Schools: Effects on Learning and Attitudes. *Education*, 39(1): 35-47.
- Kano, N., Seraku, F., & Tsuji, S. I. (1984). Attractive Quality and Must-be Quality. Hinshitsu. *The Journal of the Japanese Society for Quality Control*, 14(2):39-48.

- Knoll, M. (1997). The Project Method: Its Vocational Education Origin and International Development. *Journal of Industrial Teacher Education*, 34(3):59-80
- Krajcik, J. S., & Blumenfeld, P. (2006). Project-based Learning. In *the Cambridge Handbook of the Learning Sciences*, edited by R. K. Sawyer, 317-334. New York: Cambridge.
- Matzler K., & Hinterhuber, H. H. (1998). How to Make Product Development Projects More Successful by Integrating Kano's Model of Customer Satisfaction into Quality Function Deployment. *Technovation*, 18 (1): 25-38.
- Mergendoller, J. R., Maxwell, N. L., & Bellisimo, Y. (2006). The Effectiveness of Problem-Based Instruction: A Comparative Study of Instructional Methods and Student Characteristics. *Interdisciplinary Journal of Problem-Based Learning*, 1(2): 49-69.
- Prince, M., & Felder, R. (2007). The Many Faces of Inductive Teaching and Learning. *Journal of College Science Teaching*, March/April: 14-20.
- Raelin, J. A. (2000). *Work-based Learning: The New Frontier of Management Development*. Englewood Cliffs, NJ: Prentice Hall.
- Shen, X. X., Tan, K. C. & Xie, M. (2000). An Integrated Approach to Innovative Product Development Using Kano's Model and QFD. *European Journal of Innovation Management*, 3 (2): 91-99.
- Tal. T. & Krajcik, J. & Blumenfeld, P. (2006). Urban Schools' Teachers Enacting Project-Based Science. *Journal of Research in Science Teaching*, 43(7): 722-745
- Thomas, J. W. (2000). *A Review of Research on Project-based Learning*. California: San Rafael. Accessed 30 Jan 2017. [http://www.bobpearlman.org/BestPractices/PBL\\_Research.pdf](http://www.bobpearlman.org/BestPractices/PBL_Research.pdf)