

# A Portfolio Approach to Measure Pre-service Early Childhood Teachers

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**Abstract**—“Subject Based Learning” for students is very popular in traditional training to pre-service teachers in university. Nowadays, the teaching ways of pre-service education is becoming more and more complicate. To structure new teaching methods, even to integrate teaching methods is very important. Surely, the teaching method from crossing subject’s boundaries will be a pretty good way for teaching pre-service teachers in universities. This article brings up the new teaching method for children literacy program, so-called “Problem-based Learning” (PBL), a student-centered instructional strategy in which students collaboratively solve problems and reflect on their experiences. The main attempt for this article is to examine using PBL as teaching method whether approaching effect or not. Further, to compare PBL before and after teaching with first-hand statistical data is to understand the practical results for students. Qujing Normal University at Yunnan Province in China selected to participate this study was found out that after using PBL as teaching method, the educational effect is extremely significant ( $p < 0.001$ ). Lastly, it indicates that the challenges and problematic PBL as teaching method of children literacy education faced.

**Index Terms**—children literacy, pre-service teachers, problem-based learning, teaching method

## I. INTRODUCTION

Learner-centered instructional environment has been in today educators’ spotty has changed the focus in education from a teacher-centered instructional environment. From last century, grading policy of colleges or university proving learning insufficient in the States and other countries were subjected to conceptual criticism. Portfolios to allow individuals compose their learning via creative, reflective, and self-assessing process has become common on the cusp of the instruction and curriculum. In fact, the use of Portfolios as a sort of student performance is not new. Portfolios were introduced in the field of education as an instructional tool in the 1970s [1]-[7]. Portfolio in the context of contemporary higher education refers to collections of evidence assembled by students, teachers to enhance the effectiveness of teaching and learning, and to assess learning outcomes.

This article summarizes the results of two semesters of studying this approach to using portfolio in the

evaluation of students, and presents the results of the quantitative examination of field test data on student attitude. It also describes changes in evaluator training and in the rating scale used during the 2015 year, and their effects on the performance of evaluators who collected data from teachers and rated the teachers on the academic performance and attitude of their students. Finally, it examines some merits and challenges of this approach to the utilization of student performance data in teacher evaluation [8].

In this teaching process, teacher’s main task is to lecture about topics or issues of children literacy education subject. Although it is a popular approach for teaching, it might not suitable for children literacy class. Because what the aim of children literacy education is to increase awareness of the many forms of messages encountered everyday lives. Children literacy education should help pre-service teachers to recognize how the children literacy filter their perceptions and beliefs, shape popular culture and influence personal choices. It should empower them with the critical thinking and creative problem-solving skills to make producers of information. So children literacy education is part of the basic elements in preschool curriculum, to cultivate expression in building future citizens. Today children literacy education is indeed one of the key pre-requisites for active and full normal preschool education and is one of the contexts in which intercultural dialogue needs to be promoted.

The interaction between teacher and student is very important in children literacy class. Because to transform and to cultivate pre-service teachers is the core value of children literacy education, the inter-subjectivity for teaching situation is also necessary. The traditional and popular teaching skill -- subject based learning seems not to reach the core of children literacy education. The top-down style is different from bottom-up method, and the children literature class is closer to the latter one [9], [10].

The main attempt for this article is to examine using problem-based learning (PBL) as new teaching strategy whether approaching effect of children literacy education or not. Further, the authors compared PBL and traditional teaching method with first-hand statistical data to understand the practical results for students. The students’ comprehension ability of three core perspectives of children literacy education, namely “cognitive domain

(knowledge), affective domain (attitude) and psychomotor domain (skill)” is also deeply analyzed. By gathering statistics, the article will report the results by using PBL as teaching strategy in children literacy education. It will be helpful to increase teaching method discusses for children literacy education [10].

## II. CHILDREN LITERACY ACQUISITION

Children literacy can be viewed as a set of complex, multidimensional skills begins at preschool stage and develop over a person’s life [11]. Children are active participants in their literacy growth at an early age, taking the role of apprentice and relying on the guided participation of others to mediate their learning and development [12]. There is growing evidence that the acquisition of certain literacy skills before kindergarten is predictive of later school success [13]-[15]. Similarly, the National Early Literacy Panel (NELP) in USA synthesized the findings from over 8,000 relevant articles and identified literacy skill that had a strong, predictive relationship of future academic success; however, one third of American fourth graders read below a basic level suggesting that early literacy instruction for many American children may be inadequate. Improving early literacy instruction is critical. Early children literacy education programs can play a critical role in fostering early literacy growth in children.

Problem-based learning (PBL) is a student-centered pedagogy in which students themselves determine what and how they learn. PBL also encourages critical thinking skills, independent responsibility for learning, knowledge acquisition, sharing information, time management skills, better retention of information, and problem-solving abilities. It thus stimulates higher-order learning in students, leading to the achievement of high professional competency.

## III. METHOD

Problem-based learning is a student-centered instructional strategy in which students collaboratively solve problems and reflect on their experiences. It was used extensively at many fields nowadays, and is related to social-cultural and constructivist theories of learning and instructional design. It should empower pre-service teacher with the critical thinking and creative problem-solving skills to make producers of information.. That is, to use PBL as a teaching skill in children literacy education seems to be in place. The use of PBL, like other student-centered pedagogies, has been motivated by recognition of the failures of traditional instruction [16], [17] and the emergence of deeper understandings of how people learn [18]. Unlike traditional instruction, PBL actively engages the student in constructing knowledge in their own mind by themselves, and thus addresses many of deficits of traditional classroom where knowledge is expounded by an instructor. That is why to think and try to use PBL as new strategy in children literacy class. In PBL, students are encouraged to take responsibility for their group and organize and direct the

learning process with support from a tutor or instructor. Advocates of PBL claim it can be used to enhance content knowledge and foster the development of communication, problem-solving, and self-directed learning skill. For example, an attempt is being made to introduce a hybrid of problem-based learning in secondary mathematics called “PBLAC” in Malaysia, which stands for problem-based learning the four core areas in the mathematics education framework. These core areas are content, thinking processes, skills, & values, with the aim of nurturing citizens who are wise rather than just intelligent. Nowadays, many Malaysian universities are going for PBL purposely to improve the quality of the graduates produced.

## IV. RESULTS AND DISCUSSION

### A. Steps

In our children literacy class, all participants have role to play. Especially tutor is playing a very important role. As the following teaching steps and figure:

- 1) Step 1: Create a problem
- 2) Step 2: Problem analysis
- 3) Step3: Test Theories
- 4) Step 4: Presenting

PBL is hands on and student centered, and our class promotes: (1) teamwork; (2) creative thinking; (3) individualization; and (4) most importantly motivate students to learn, see in Fig. 1. So everyone who takes part in the class has tasks for role-playing to achieve know-how knowledge of children literacy.



Figure 1. Roles of participants in a PBL tutorial by Wood, D.F. (2003)

TABLE I. BEFORE-CLASS RELIABILITY TESTING RESULT

	Mean of Items	Variance of Items
N	30	30
Mean	2.585	.833
Minimum	1.781	.524
Maximum	3.250	1.226
Range	1.469	.703
Minimum/Maximum	1.825	2.342
Variance	.122	.027

### B. Statistics Description & Finding

PBL as teaching strategy whether approaching effect of children literacy education or not, a questionnaire was designed to test the teaching result. 288 students were selected in children literacy subject in 2015 second

semester. 30 items in pre-test section was taken before formal test. The questionnaire testing was the same for before and after semester-class. The descriptive statistics were the following, see in Table I.

TABLE II. CRONBACH'S ALPHA BEFORE-CLASS RELIABILITY STATISTICS

N of Items	Cronbach's Alpha for Items
30	.969

TABLE III. AFTER-CLASS RELIABILITY TESTING RESULT

	Mean of Items	Variance of Items
<b>N</b>	<b>30</b>	<b>30</b>
<b>Mean</b>	<b>4.168</b>	<b>0.549</b>
<b>Minimum</b>	<b>2.792</b>	<b>.300</b>
<b>Maximum</b>	<b>4.625</b>	<b>1.556</b>
<b>Range</b>	<b>1.833</b>	<b>1.256</b>
<b>Minimum/Maximum</b>	<b>1.657</b>	<b>5.187</b>
<b>Variance</b>	<b>.144</b>	<b>.02.0547</b>

TABLE IV. CRONBACH'S ALPHA AFTER-CLASS RELIABILITY STATISTICS

N of Items	Cronbach's Alpha for Items
30	.884

A good and effective questionnaire should have 0.8 or above Cronbach's Alpha value. We got  $\alpha=0.969$  and 0.884, see in Table II, Table III & Table IV, that is run by SPSS 18, so it is a consistent questionnaire. In three perspectives of this subject, namely: "cognitive domain (knowledge), affective domain (attitude) and psychomotor domain (skill)", we designed five children literacy knowledge parts – children literacy representation, children literacy content, children literacy organization, audience, and children literacy access-included in the questionnaire. Here are the test results;

TABLE V. BEFORE AND AFTER PBL TEACHING TO 3 PERSPECTIVES

Performance of Class		Mean	T-Value	Degree of Freedom	Significance
Before	Cognitive Domain of Children literature	29.70	-24.725	287	p<0.001***
After		44.07			
Before	Affective Domain of Children literature	25.50	-25.172	287	p<0.001***
After		43.00			
Before	Psychomotor domain of Children Literature	22.34	-24.979	287	p<0.001***
After		37.97			

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Before PBL teaching, students do not get good grade for outcomes in 3 perspectives (Mean is from 10-50), "cognitive domain of children literacy" is 29.70 and "psychomotor domain of children literacy" is the lowest 25.50, see in Table V. We can say that students didn't have knowledge to children literacy before class. But after PBL teaching performance, three parts all raise to

higher scores. Especially in perspective of cognitive domain of children literacy is extremely significant (from 29.70 to 44.07,  $p<0.001$ ). The other two parts are still significant (from 25.50 to 43.00 & 22.34 to 37.97). To proceed the statistics after PBL teaching, we find out students' learning effects are extremely significant in three perspectives. And they have much different advancement for children literacy as Table VI.

TABLE VI. BEFORE AND AFTER PBL TEACHING TO CHILDREN LITERACY KNOWLEDGE PARTS

Five parts of Children Literacy Knowledge		Mean	T-Value	Degree of Freedom	Significance
Before	Children literature Representation	15.70	-22.738	287	p<0.001***
After		25.20			
Before	Children literature Content	15.56	-22.948	287	p<0.001***
After		24.77			
Before	Children Literature Organization	16.24	-23.390	287	p<0.001***
After		25.32			
Before	Audience	15.68	-23.798	287	p<0.001***
After		25.97			
Before	Children Literature Access	14.38	-21.041	287	p<0.001***
After		24.18			

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

To go on, we compare to students' learning effect with 5 parts of children literacy knowledge before and after PBL teaching performance. Before PBL teaching, students' knowledge of children literacy is not enough; only 14 to 16 (Mean is from 10-30). It appears students need more training. Especially in "children literacy access", the score tells us should be emphasized. After PBL teaching, every parts of children literacy knowledge are significant growing. All of them are over 24, belongs to high level. As T-Value, we can see extremely significant ( $p<0.001$ ). That is meaning PBL teaching is suitable to structure students' children literacy knowledge. Last, we want to analyze the "children literacy access" learning is effective or not by PBL. We got the information as Table VII.

TABLE VII. BEFORE AND AFTER PBL TEACHING TO 5 CHILDREN LITERACY KNOWLEDGE PARTS

Performance of Class		Mean	T-Value	Degree of Freedom	Significance
Before	Cognitive Domain of Children literature	5.65	-19.326	287	p<0.001***
After		8.95			
Before	Affective Domain of Children literature	4.74	-19.189	287	p<0.001***
After		8.56			
Before	Psychomotor domain of Children Literature	3.99	-13.927	287	p<0.001***
After		6.67			

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Apparently, "children literacy access" is the core of children literacy education. To understand PBL teaching whether effective to children literacy access or not is still critical. When we see the result of questionnaire, before and after PBL teaching grade are 5.65 vs. 8.95; 4.74 vs.

8.56; 3.99 vs. 6.67. By T-Value result appears, the extremely significant is clear ( $p < 0.001$ ). That is meaning PBL teaching is good effect to students' children literacy access of children literacy. Totally to say, the PBL teaching strategy using for children literacy is plus to children literacy education.

### C. Limitations of the Study and Discussion

By questionnaire-test to PBL teaching result for children literacy, the finding is to use PBL as method is good and suitable to children literacy education [19], [20]. But it is still a preliminary study to this field. It supposed to be support if PBL teaching is examined for children literacy teaching, the quality study and methods should be equally emphasized or stressed. That will be more complete.

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### REFERENCES

- [1] J. A. Amador, L. Miles, and C. B. Peters, *The Practice of Problem-Based Learning: A Guide to Implementing PBL in the College Classroom*. San Francisco: Jossey Bass, 2006.
- [2] D. Boud and G. I. Feletti, *The Challenge of Problem-Based Learning*, 2<sup>nd</sup> Ed. London: Kogan Page Ltd., 1997.
- [3] C. Briscoe and E. Wells, "Reforming primary science assessment practices: A case study of one teacher's professional development through action research." *Teach. Res.*, 2002, vol. 86, pp. 417-435.
- [4] S. Callahan, *All Done with Best of Intentions: One Kentucky High School after Six Years of State Portfolio Tests*, *Assessing Writing*, 1999, vol. 6, no. 1, pp. 5-40.
- [5] C. Danielson and L. Abrutyn, *An Introduction to Using Portfolios in the Classroom*. Alexandria, Virginia, USA: Association for Supervision and Curriculum Development, 1997.
- [6] B. J. Duch, S. E. Groh, and D. E. Allen, *The Power of Problem-Based Learning*, VA: Stylus, 2001.
- [7] M. D. Reckase, "Practical experiences in implementing a national portfolio model at the high school level," *National Association of Secondary School Principals (NAASP) Bulletin*, vol. 79, pp. 31-36, 1995.
- [8] D. K. Dickinson, A. McCabe, and M. J. Essex, *A Window of Opportunity we Must Open to all: The Case for Preschool with High-Quality Support for Language and Literacy*, New York, NY: Guilford Press, 2006, vol. 2, pp. 11-28.
- [9] G. Koh, H. Khoo, M. Wong, and D. Koh, "The effects of problem-based learning during medical school on physician competency: A systematic review," *CMAJ*, vol. 178, no. 1, pp. 34-41, 2008.
- [10] J. P. Kremenitzer and T. Myler, "Collaboration between teacher educator and kindergarten teacher: A 4-year action research study to improve our own professional practices," *Childhood Education*, vol. 82, no. 3, pp. 165-171, 2006.
- [11] K. Duckworth, "School readiness and later achievement," *Developmental Psychology*, vol. 43, pp. 1428-1446, 2007.
- [12] B. H. Wasik and S. Herrmann, "Family literacy: History, concepts, services," in *Handbook of Family Literacy*, B. H. Wasik, Ed., Mahwah, NJ: Erlbaum, 2004, pp. 13-22.
- [13] B. Rogoff, *Observing Sociocultural Activity on Three Planes: Participatory Appropriation, Guided Participation, and Apprenticeship*, Boston, MA: Cambridge University Press, 1995, pp. 139-164.
- [14] J. K. Torgesen, "Catch them before they fall: Identification and assessment to prevent reading failure in young children," *American Educator*, vol. 22, pp. 32-39, 1998.
- [15] C. E. Snow, S. Burns, and P. Griffin, *Preventing Reading Difficulties in Young Children*, Washington, DC: National Academy Press, 1998.
- [16] B. H. Wasik, M. A. Bond, and A. Hindman, "The effects of a language and literacy intervention on head start children and teachers," *Journal of Educational*, vol. 98, pp. 63-74, 2006.
- [17] D. F. Wood, "Problem based learning," *BMJ*, vol. 30, pp. 326-328, 2003.
- [18] Boyer, "Reinventing undergraduate education: A blueprint for america's research universities," presented at Commission on Educating Undergraduates in the Research University for the Carnegie Foundation for the Advancement of Teaching, 1998.
- [19] H. S. Barrows, "Problem-based learning in medicine and beyond: A brief overview," in *New Directions for Teaching and Learning*, L. Wilkerson and W. H. Gijsselaers, Eds., San Francisco: Jossey-Bass, 1996, vol. 68, pp. 3-13.
- [20] Wingspread, "Quality assurance in undergraduate education: What the public expects," presented at Education Commission of the States, Denver, CO, 1994.

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