The Effect of Play-Based Personalized Learning Model on Students' Expert Learning

Pariya Pariput* and Thooptong Kwangsawad

Faculty of Education, Mahasarakham University, Muang, Mahasarakham 44000

*Corresponding author. E-Mail address: kaipariya@hotmail.com

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Abstract

This article aimed to examine the effects of the play-based personalized learning model to promote expert learners who were able to use three strategies (cognitive, motivational and environmental strategies) to complete the tasks through the process of metacognitive control (plan, monitor and evaluation) and were able to reflect on their learning after complete the tasks. Samples used in this study were seven first grade students selected through purposive sampling. The researchers used observations and interviews to collect data. Statistics used to analyze data were percent, mean, standard deviation and chi-square. A non-parametric Friedman test of differences among repeated measures was conducted to determine a statistical difference between three measurements. The findings showed that students were able to perform their expert learning at 50.26 percent, 64.81 percent and 76.98 percent for the first, second and third month of assessment respectively. The used of Friedman test to compare three times of the performance of expert learning found that in the overall, it was statistically significant at $p<.05$. Based on the findings, it may be concluded that play- based personalized learning is a learning approach that teachers can use to develop students' expert learning.

Keywords: Play-Based Personalized Learning, Expert Learning, Learning Strategies

Introduction

Teaching and learning in the 21st century suggest that successful education must provide a set of fundamental skills that are transferable and adaptable for whatever the future holds. Children need to be provided with a sound basis of skill acquisition to develop a range of thinking to learn how to learn. Students require empowerment, engagement, ownership, and motivation as key criteria with which to learn and sustain learning and skills. They also need active investigation and some freedom to explore and construct learning based on their interests alongside guidance, scaffolding, direction and instruction from their teachers (Joyce, Weil and Calhoun, 2011). As a result, teaching and learning must emphasize skills and 'learning how to learn'. New developments of learning process also underline the importance of helping students control of their learning (Bransford, Brown and Cocking, 2000). Teachers must assume imperative parts in instructing and learning procedure to help transform fledgling learners into expert learners who can control of their learning.

Ertmer and Newby (1996) describe expert learners as people who can use the knowledge that they have gained of themselves as learners including the knowledge of task requirements, and the knowledge of specific strategies used to select deliberately, control and monitor strategies needed to achieve desired learning goal. Teachers can use personalized learning to help students become expert learners since personalized learning is a learning process that creates a learner-driven environment where learners can develop the skills and strategies (Bray and McClaskey, 2015). In personalized learning environment, the learners fully understand how they learn. They are no longer the vessels where knowledge poured into them but are learners who are motivated and engaged because they have a voice, choice and can monitor their learning (Bray and McClaskey, 2016).

Personalized learning has been developed around the world. The Walker Learning Approach (WLA) is one of the personalized learning models. It is a learning

approach that authentically personalized learning, a holistic approach and hands-on investigations. The WLA integrates play-based learning which emphasizes the individual exploration and investigation in learning (Bray and McClaskey, 2015). An essential part of the WLA learning environment is to guarantee that students have opportunities all the time to build, to make, to investigate and examine in ways that are deliberate, arranged, purposeful and powerful by the educator and particularly, painstakingly and deliberately set up in ways that encourage and create aptitudes such as critical thinking, self-start, profound level considering, going out on a limb, developing significance and building up a scope of extra abilities (Walker, 2012).

In this study, the researchers designed and developed the play- based personalized learning model to promote expert learners who were able to use three strategies (cognitive, motivational and environmental strategies) to complete tasks through the process of metacognitive control (plan, monitor and evaluation) and were able to reflect on their learning after complete the tasks. The research activities conducted in four phases; 1) reviewing literature and studying the context, 2) developing the learning model, 3) examining the effect of implementation of the learning model, and 4) expanding the use of the learning model to confirm the results of the implementation of the learning model. The results reported here is phase three (examining the effect of implementation of the learning model).

Literature Review

Personalized Learning

Personalized learning is an emerging trend which seeks to support student-centered, 21st-century teaching and learning. Student achievement likely increase when students can learn by themselves with a variety of teaching styles and strategies available to them. Personalized learning approach is built on the assumption that given the ability to self-direct their learning, students will make greater gains in achievement due to increased interest and customization (Hanover Research, 2012). Personalized learning emphasizes the educational concepts of individualization (adapting teaching strategies to meet the needs of different learners) and differentiation (adapting teaching to fit the learning preferences of different learners) to connect to the learner's experiences and interest, abilities of every student through tailoring curriculum and learning activities to the individual. The final aim of a personalized learning is to create an educational system that responds to the diverse needs of individuals rather than imposing a 'one size fits all' model on students (Bates, 2014; Williams, 2013).

The Walker Learning Approach

The WLA is the first major Australian based total and holistic pedagogy (preschool to year 8) to be designed and implemented. It is based on decades of research about play-based personalized learning and social constructivism. Furthermore, the WLA provides a platform for evidence, research and practical strategies to schools which seek high levels of student engagement, motivational and personalized learning; and for students to be independent learners who are acquiring skills, not just content (Walker, 2012).

The WLA pedagogy naturally embeds all of the key values and philosophy in a developmentally and culturally appropriate way. In the early childhood years, children are engaged in exploratory play with no formal teaching, in the Prep-Year 2 children are engaged in investigative concrete hands-on experiences that are balance and integrated with formal teaching. The year 3 to 8 children are engaged in project-based learning that is child-centered and integrated with formal teaching. The WLA pedagogy changes to suit the developing child while maintaining the inclusion of all key values and practices that are consistent with the WLA philosophy (Walker and Bass, 2012). The following figure illustrates the WLA Developmental Pedagogical Continuum.

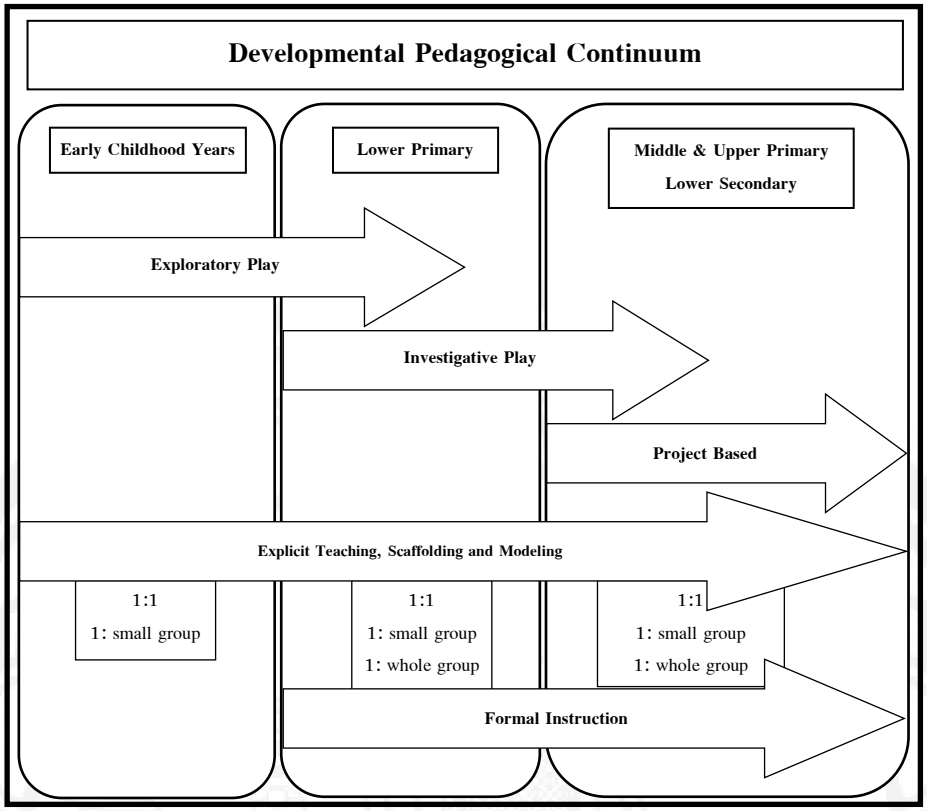

Figure 1 The WLA Developmental Pedagogical Continuum (Walker and Bass, 2012)

Play and active investigation are all important vehicles for developing self-regulation as well as for promoting, cognition, language and social skills in children of all ages. Play provides children opportunities to develop their physical skills and enjoyment of the outdoors, make sense and understand their world. It is also to control, express emotions, interact with others, develop symbolic and problem-solving abilities and practice emerging skills. The skills that are just beginning to show e.g., learning to share, take turns, not hit or bite our friends. Research shows strong connections between play and foundational capabilities such as memory, self-regulation, social skills, and oral language skills (Walker, 2012).

Walker (2012) describes that the key point of this approach is that play used as a teaching and learning tool is not 'free play'. Teachers do not just allow children to play when the real work is finished, or employ play to help children settle in. The play is always purposeful, linked to learning objectives and is the major strategy for teaching and learning. Teachers provide learning experiences through investigative play which consists of three distinct core elements of the investigations:

1) *Tuning in for the learning of the day*. The teacher helps children to focus on their learning from the previous day and directs them into the work for the morning. It is the major aim of this first meeting time. This is a particularly important time to set the tone and pace for the whole day. The teacher models the language of learning that is consistent with the intention mapped out in the learning intentions. It is tuning in for the learning for the whole day, not just for investigations.

2) *Investigation*. The children's investigations take place after tuning in and require a minimum of 45 minutes. In the first part of investigations the teacher will scaffold the focus children, reporter, and photographer. In the second part of investigations, the

teacher will scaffold and observe children who may need support or extend.

3) *Reflection*. Reflection time is a critical aspect of the WLA pedagogy. Teachers can never run investigations without having a reflection time. Reflection time is not show and tell. Reflection time helps to identify the learning that has occurred during the session and most importantly is a springboard and links back into the literacy and numeracy that is occurring for the rest of the day.

Expert Learners

Expert learners refer to the learners who can plan, set goals, organize, self-monitor and self-evaluate at various points during the process of knowledge acquisition. Expert learners set reasonable learning goals for themselves and have the self-efficacy to choose and use productive learning strategies to accomplish academic tasks with confidence, diligence, and resourcefulness (Zimmerman, 2000). They also reflect upon their learning (Robinson, 1993). Ertmer and Newby (1996) list three characteristics of the expert learners:

1) *Expert learner as a strategic knowledge user*. There are two distinct sorts of meta-cognitive knowledge that expert learners utilize to bring about expert learning. First, knowledge of task-requirements includes information about the type of task to be accomplished, and the types of strategies and resources that are most effective for accomplishing given tasks. This information may be a cognitive, motivational and environmental nature. Second, knowledge of personal resources includes an awareness of one's prior knowledge and previous experience with the content to be learned, and information regarding one's skill at employing the various types of learning strategies suggested by the task. These learning strategies may be of a cognitive (e.g., mnemonics, outlining, elaboration, etc.), motivational (e.g., setting goals, providing self-reinforcement, using positive self-talk), and/or environmental nature (e.g., arranging study space, scheduling adequate time, utilizing outside resources).

2) *The expert learner as self-regulated*. Expert learners are self-regulated learners. They use the process of self-regulation to manage their learning (planning, monitoring, and evaluating) to bring about successful learning.

3) *The expert learner as reflective*. Expert learners can reflect on their previous, ongoing, and future learning. Reflection uses prior knowledge to acquire new knowledge. At each stage in the metacognitive control process, expert learners use the metacognitive knowledge that they have gained from previous learning experiences to identify what the current task requires concerning cognitive, motivational, and environmental strategies and to determine if their personal resources are adequate to effectively manage the task. The following figure illustrates the expert learning model developed by Ertmer and Newby.

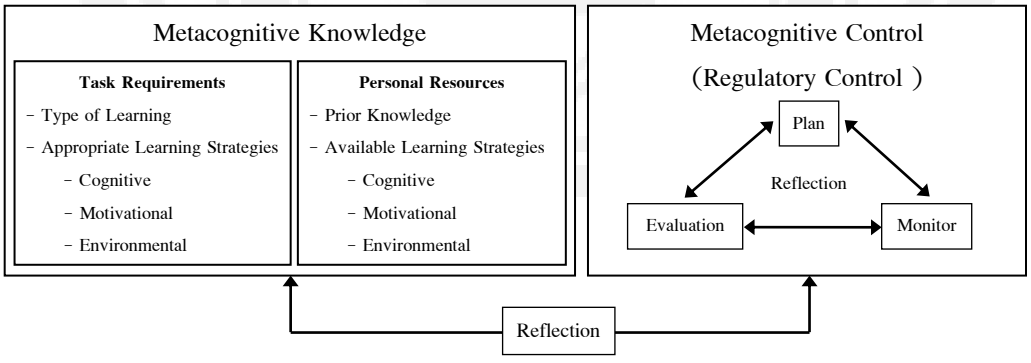

Figure 2 Expert Learning Model (Ertmer and Newby, 1996)

Materials and Method

Research Objective

This research aimed to examine the effects of the play-based personalized learning model to promote expert learners who were able to use three strategies (cognitive, motivational and environmental strategies) to complete the tasks through the process of metacognitive control (plan, monitor and evaluation) and were able to reflect on their learning after complete the tasks.

Population and Sample of the Research

The population of this research was the first grade students from small rural public elementary schools in Kalasin province, Thailand. The samples used in this study were 7 (3 male, 4 female) selected through purposive sampling.

Research Instruments

Research instruments were twenty-four WLA-based lesson plans (each consisting of three stages; tuning in, investigation, and reflection) interview and observation which were verified for appropriateness and validity by seven experts that were consistent and appropriate at high level.

Collecting and Analyzing Data

The researchers designed twenty-four WLA-based lesson plans, each consisting of three stages; tuning in, investigation, and reflection. The lesson plans were implemented in the classrooms and assessment of the samples' ability to perform expert learning once a month, for three months. The researchers used observations and interviews to collect data. Each student had to answer questions after he/she had finished each task. The questions focused on the three strategies that each student used during performing three tasks and observation of each student's performance task reflection. To define the quality of answering questions, the researchers used scoring rubrics that were developed according to the definition of the expert learner. Statistic used to analyzed data was percent. A non-parametric Friedman test of differences among repeated measures was conducted to determine a statistical difference between three measurements.

Results

Table 1 Students' expert learning scores and percent of ability to use strategies to complete the tasks and the capacity to reflect on performing the tasks

Expert Learning (Total Scores)	Month 1		Month 2		Month 3	
	Scores	Percent	Scores	Percent	Scores	Percent
1. Strategies (322)	**162**	**50.31**	**202**	**62.73**	**246**	**76.40**
1.1 Plan (98)	**61**	**62.24**	**71**	**72.45**	**82**	**83.67**
1.1.1 Cognitive Strategies (42)	20	47.62	29	69.05	36	85.71
1.1.2 Motivational Strategies (28)	21	75.00	26	92.86	26	92.86
1.1.3 Environmental Strategies (28)	20	71.43	16	57.14	20	71.43
1.2 Monitor (112)	**67**	**59.82**	**75**	**66.96**	**88**	**78.57**
1.2.1 Cognitive Strategies (42)	24	57.14	29	69.05	35	83.33
1.2.2 Motivational Strategies (28)	20	71.43	23	84.14	27	96.43
1.2.3 Environmental Strategies (42)	23	54.76	23	54.76	26	61.90
1.3 Evaluation (112)	**34**	**30.36**	**56**	**50.00**	**76**	**67.86**
1.3.1 Cognitive Strategies (56)	5	8.93	19	33.93	30	53.57
1.3.2 Motivational Strategies (28)	17	60.71	23	82.14	28	100.00
1.3.3 Environmental Strategies (28)	12	42.86	14	50.00	18	64.29
2. Reflection (56)	**28**	**50.00**	**43**	**76.79**	**45**	**80.36**
Total (378)	**190**	**50.26**	**245**	**64.81**	**291**	**76.98**

Table 1 present students' expert learning scores and percent of ability to use strategies to complete the tasks and the capacity to reflect on performing the tasks for three months. The results of using three times repeated measurement found that students were able to perform their expert learning at 50.26 percent, 64.81 percent and 76.98 percent for the first, second and third month of assessment respectively.

Table 2 Students' ability to use strategies to complete the task and the capacity to reflect on performing the task

Expert Learning		$\bar{x}$	S.D.	Mean Rank	Chi-Square	p
Strategies					**11.14**	**.004***
	Month 1	23.14	5.93	1.29		
	Month 2	28.86	4.67	1.71		
	Month 3	35.14	2.85	3.00		
Reflection					**10.75**	**.005***
	Month 1	4.00	0.00	1.07		
	Month 2	6.14	0.90	2.36		
	Month 3	6.43	1.27	2.57		
Total					**13.56**	**.001***
	Month 1	27.14	5.93	1.07		
	Month 2	35.00	4.40	1.93		
	Month 3	41.57	2.88	3.00		

Table 2 presents the use of Friedman test to compare three times of the performance of expert learning. The results showed the significance ($p < .05$). And the results of the students' ability to use strategies to complete the tasks and the capacity to reflect on performing the tasks also showed the significance ($p < .05$).

Table 3 Students' expert learning among three steps of metacognitive process (plan, monitor, and evaluating)

Process of Metacognitive Control		$\bar{x}$	S.D.	Mean Rank	Chi-Square	p
Plan					**7.92**	**.019***
	Month 1	8.71	2.06	1.36		
	Month 2	10.14	2.04	1.86		
	Month 3	11.71	1.50	2.79		
Monitor					**4.53**	**.104**
	Month 1	3.43	1.81	1.57		
	Month 2	4.14	1.35	1.93		
	Month 3	5.00	1.00	2.50		
Evaluation					**13.00**	**.002***
	Month 1	4.86	1.57	1.07		
	Month 2	8.00	1.53	2.00		
	Month 3	10.86	1.57	2.93		

Table 3 presents the use of Friedman test of difference among repeated measures. The overall results were significant ($p < .05$). However, the students' expert learning scores measured during monitor step was not statistically significant ($p = .104$).

Table 4 Students' cognitive, motivational and environmental strategies

Strategies	$\bar{x}$	S.D.	Mean Rank	Chi-Square	p
Cognitive Strategies				**12.56**	**.002***
Month 1	0.71	0.95	1.07		
Month 2	2.71	1.50	2.07		
Month 3	4.29	0.76	2.86		
Motivational Strategies				**8.10**	**.017***
Month 1	2.43	0.79	1.36		
Month 2	3.29	0.95	2.00		
Month 3	4.00	0.00	2.64		
Environmental Strategies				**4.67**	**.097**
Month 1	1.71	0.76	1.71		
Month 2	2.00	0.00	1.93		
Month 3	2.57	0.98	2.36		

Table 4 presents the use of Friedman test to measure students' cognitive, motivational and environmental strategies. The overall results were significant ($p < .05$). However, there was no statistically significant in students' environmental strategies ($p = .097$).

Conclusion and Discussion

The purpose of the study was to examine the effect of play-based personalized learning model to promote expert learners. The results of the study were significant. The students were able to use three strategies (cognitive, motivational and environmental strategies) to complete the tasks through the process of metacognitive control (plan, monitor and evaluation) and were able to reflect on their learning after complete the tasks. Based on the findings, it may be concluded that play- based personalized learning was a learning approach that teachers may use to develop students' expert learning. Since it provide the students opportunity to investigate how to use strategies to solve problems. It also allowed the students to reflect on what they had learned from investigative play. However, the result showed that the students' expert learning scores measured during monitor step was not statistically significant ($p = .104$). The finding suggested that the students may not develop effective strategies to monitor their learning. It can be argued that the students need more time to develop their strategies, especially, young learners. Further research may need to extend the amount of time for data collection at least two weeks to determine a baseline and implement the intervention for twenty to twenty-five weeks. With a larger window of time, it is possible that research results will become consistent or show a steady trend, and changes or interruptions would have less impact on data.

In addition, the study found that there was statistically no significant in students' environmental strategies ($p = .097$). The finding suggested that the students rarely utilized environmental strategies to complete the task. They may lack knowledge on what kind of study conditions were best for meeting the requirements of this task, and when and where they could study best as well as what time and place available for the task. Walker and Bass (2012) point out that the key element of the WLA pedagogy is that teachers provide scaffolding and support for children to challenge and extend themselves through their chosen investigations. Thus teachers have to demonstrate the effectiveness of environment strategies through modeling and practice, showing students how they can improve their task performance.

The results revealed that the WLA had the significant effect on students' expert learning achievement. The WLA was developed in Australia by Australians. It is

applied across Australia in public and private schools and many countries including New Zealand, Indonesia, and China. This study found that it was possible that the WLA could be applied in the Thai context. However, some teachers may feel reluctant to use the WLA as it requires them to do something differently from what they are familiar. Teachers, therefore, should receive assistance and encouragement in trying out the WLA. This constraint can be accomplished by providing opportunities for teachers to attend in-service teacher training programs. Such opportunities for in-service training are imperative for the long-term development of teachers as well as for the long-term success of the schools or institutions.

There were two limitations to this study. First, the small size of the sample population (N = 7) sheded doubt on the validity of the observed significance. A replication study with a greater number of subjects is needed to obtain reliable and generalizable results. Further research is required on large samples preferably independent samples to find out more valid results or to have deeper insight regarding the use an effectiveness of play-based personalized learning in Thailand and other countries. Second, since the students were young learners, the researchers could only use observations and ask questions to assess the students' expert learning. The problem needs to be solved by devising alternative assessment techniques that tap various aspects of young learners' expert learning.

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