Electronic Learning for Preschool Preparation under Parental Guidance: A Case Study of Thai Educational System

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Abstract
Failures in human development lead to many problems in many countries. Effective child development is a cornerstone of human resources and useful knowledge and skills gained during childhood will be the foundations of later learning. But preschool education is not available in every country. Some countries still lack good systems for child preparation before elementary schools. Preschool in Thailand varies from school to school since it is not compulsory and there is no national standard framework. Therefore, some children do not have access to preschool preparation. Nowadays, the Internet and web technology are widely available. Electronic learning could be used to reduce knowledge gap between children who are starting elementary schools. However, children at this age still lack skills in reading, listening, speaking, and writing. Hence, the proposed system focuses on an assisted learning environment under parents, teachers, or other assistants who can guide children in the learning context. The educational content covers a range equivalent to the preschool or pre-elementary school level-1 to level-3 of a selected case study school (kindergarten school). Therefore, the goal of the proposed system is to enable children to acquire their competencies for learning at the first elementary level. In addition to knowledge gap reduction, the system can be adopted as the learning media for home education or a learning center in any community.

Keywords: Child development, Electronic learning, Preschool preparation, Web-based classroom

Introduction

Education is very important for human resource development in every country around the world. Failures in human resource development lead to many problems. Therefore, each country needs a well-organized system for human resource development. Effective child development plays a key role and is one of key success factors for human resource development. Late problem resolution would make the problems more complicated and more expensive to manage such as poor quality children caused by poor quality education systems. Knowledge and skills gained during childhood will be the foundation of later learning. Preschool education is important for preparing these knowledge and skills. Preschool education is not mandatory in every country. Some countries still lack good systems for child preparation before elementary schools. Preschool education in Thailand is not mandatory although recently the Thai government announced its policy to extend formal education to cover preschool education. Many parents do not have awareness of this policy. National education framework for preschool curriculums is still unclear in terms of learning areas and quality assurance management. Preschool education management in Thailand varies from school to school. Low-income parents pay less concern in preschool education for their children and low educated parents have less engagement of early childhood development. Therefore, this study proposes an electronic learning system for preschool preparation in order to reduce the gap of knowledge among children when starting at the first grade of elementary level since nowadays, the internet and web technologies are widely used.

Background

Child development can be started from infants to adolescents or teenagers. Four perspectives of child development should be concerned [Cook, 2005; UNICEF, 2001] such as physical development, social and emotional development, intellectual development, and communication and speech development. Children during infancy and early childhood need a lot of supports from their parents or assistants. Parental engagement in early childhood learning will lead to strong foundation of their children's academic development and achievement [Daniel, 2016; Huntsinger, 2016]. Children during early childhood also show some specific characters [Cook, 2005], for example: enjoy learning new skills; learn language rapidly; talk and ask many questions; enjoy co-operative; intuitive thought and respond to reasoning, and symbols in language, artwork, and play. There are also some limitations of children during early childhood such as an inability to use more forms of logic, conservation problems, lack of reversibility, still makes errors of tenses, and fear loss of care. Background knowledge gained during early childhood has potential significance to later learning. Quality of learning and experienced environments from preschool education affect childhood development during elementary education [Broekhuizen, 2016; Buckrop, 2016; Lehrl, 2016; Li, 2016]. However, self learning processes are very important for child development. Some findings from the study reported in [Lerkkanen, 2016] claim that better reading skills upon entering schools were associated with a higher level of child-centered teaching practices in the classroom.
Nowadays, the Internet and web-based applications are widely used in many activities. Several learning activities have been adopted via the Internet and web technology. Technologies, especially computer-based technologies, have been

successfully used to assist parents involving with their young children's learning [Hall, 2015; Liaw, 2007]. Electronic learning or e-learning is one of these technologies that are often used to deliver learning materials to learns and have potential to enhance child development. Young children are very keen to use computers. However, some factors influencing learner satisfaction for e-learning should be concerned as follows [Sun, 2008]:

- Learner computer anxiety
- Instructor attitude toward e-learning
- E-learning course flexibility
- E-learning course quality
- Perceive usefulness
- Perceive ease of use
- Diversity in assessments

Case Study

Thai education system [Office of the Education Council, 2013] consists of formal education and non-formal education. Formal education consists of two levels: basic education and higher education. The basic education system called the 6-3-3 formal school system comprises six-year primary education, three-year lower secondary education, and three-year upper secondary education. In addition to the formal school system, vocational education comprises three-year upper secondary education leading to the lower certificate and three-year post secondary education leading to a diploma. The upper secondary level in vocational education is equivalent to the upper secondary level in the formal school system. Twelve years of free education due to the constitution cover from primary education to upper secondary education. The basic education curriculum consists of eight learning areas as follows:

- Thai language
- Mathematics
- Science
- Social studies
- Religion and culture
- Health and physical education
- Arts
- Occupation and technology
- Foreign languages

As mentioned before that preschool curriculums and preschool learning management in Thailand vary from school to school, some learning plans and activities at preschools and kindergartens were investigated via the Internet. The local municipal school, Wat Klong Rian School, was also selected as the case study. This school focuses on activity-based learning and integrated knowledge rather than disciplinary knowledge. Its preschool education is divided into three levels: Level-1 or Anuban-1, Level-2 or Anuban-2, and Level-3 or Anuban-3, offering to children of the age from around 3 years to 5 years. Content design for the proposed system is based on investigated data from reviews, related research, and the case study.

Proposed System

Since the target goal is to reduce the gap of basic knowledge among children who are starting elementary schools. Therefore the proposed electronic learning system is based on early childhood development or suitable for children of ages around three to six years. Learning activities are under parental guidance or assistance and learning environments for the proposed system can be at homes or nurseries or child care centers or schools where the Internet is available. Some knowledge from our case studies is also taken to account. Many preschool kindergartens in Thailand design their curriculums divided into core learning areas such as Thai language, Mathematics, English, Science, Social Studies while some schools focus on activity-based learning with integrated knowledge for real world activities. Figure 1 shows the system conceptual framework and Figure 2 shows the system use-cases from an analysis process.

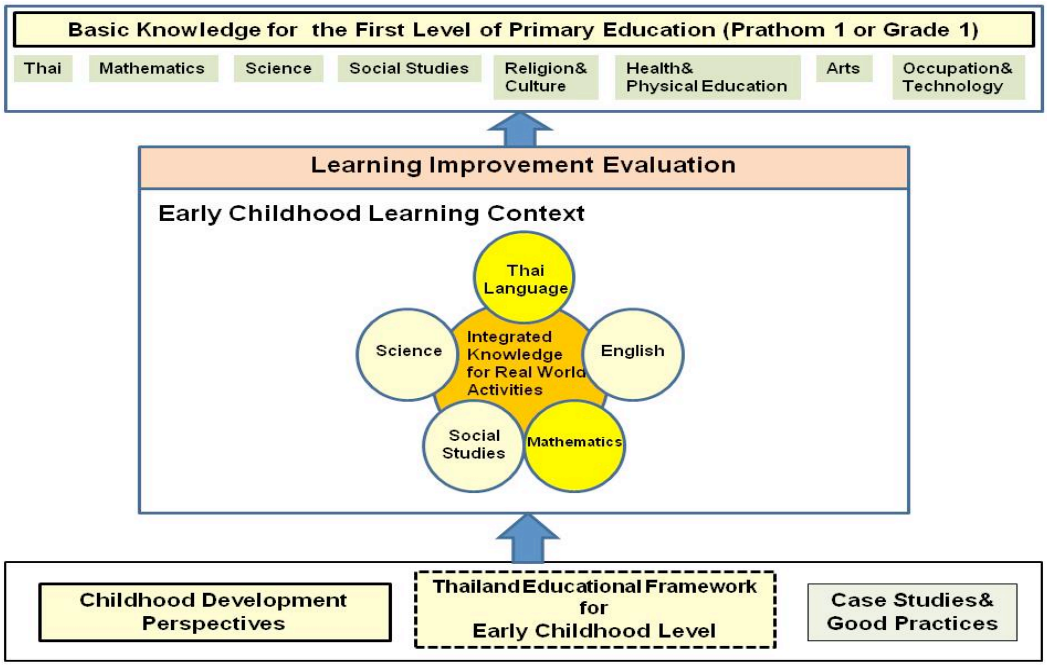

Figure 1: The system conceptual framework

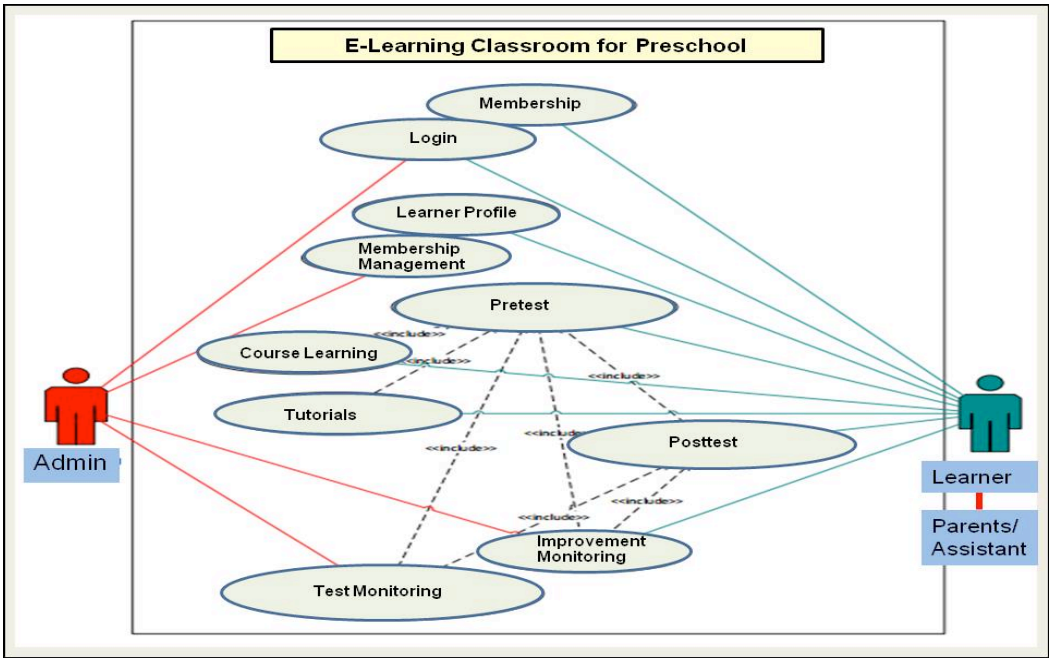

Figure 2: The system use-cases

Results

The proposed system was prototyped according to the conceptual framework and two learning areas: Thai language and Mathematics were selected as the pilot study. Three levels of preschool kindergarten, Level 1 to Level 3, were analyzed and designed for the selected learning areas. Learning materials consist of the learning contents for children and the parental guide. Since English is not mother-tongue and an official language in Thailand, all user interfaces were designed using mainly Thai language. Figure 3 shows the menu for selecting a learning level while Figure 4 shows the menu for selecting a learning area. Some examples of the user interfaces for learning Thai language as shown in Figure 5 to Figure 8. Figure 9 to Figure 13 show some examples of the user interfaces for learning Mathematics. Parents or assistants can monitor the learning improvement of their children from the pre-test and post-test bar graphs as shown in Figure 14.

Figure 3: The menu of learning level selection

Figure 4: The menu of learning area selection

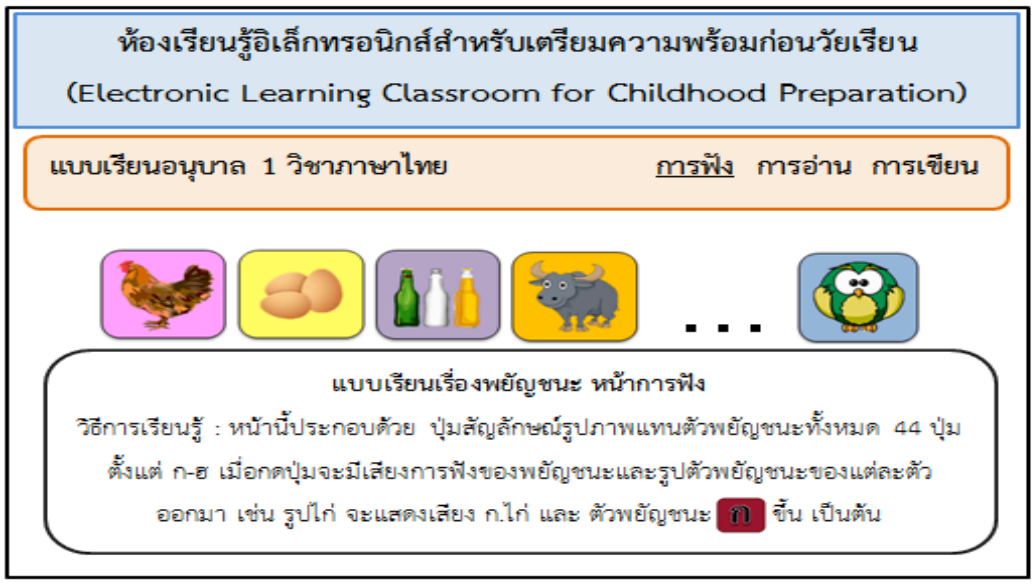

Figure 5: The menu of Thai alphabet listening

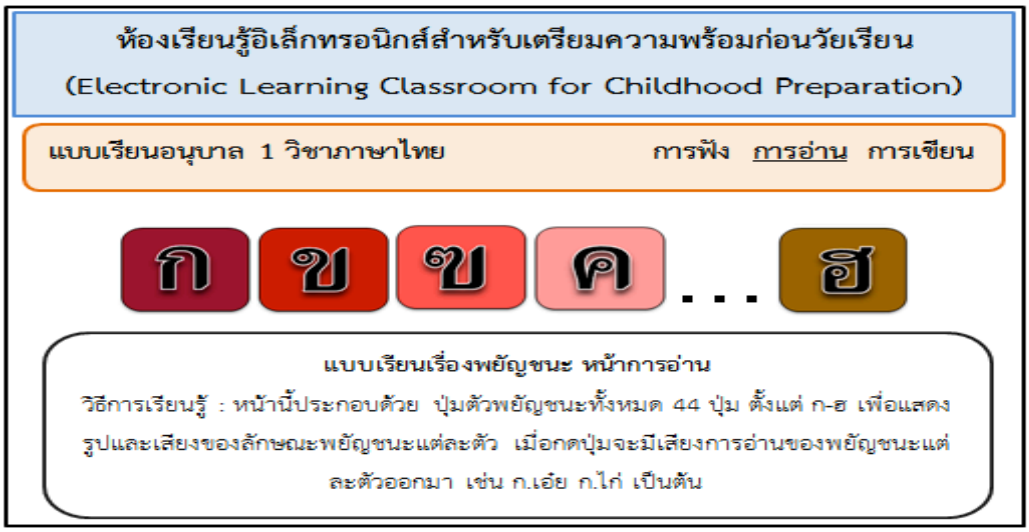

Figure 6: The menu of Thai alphabet reading

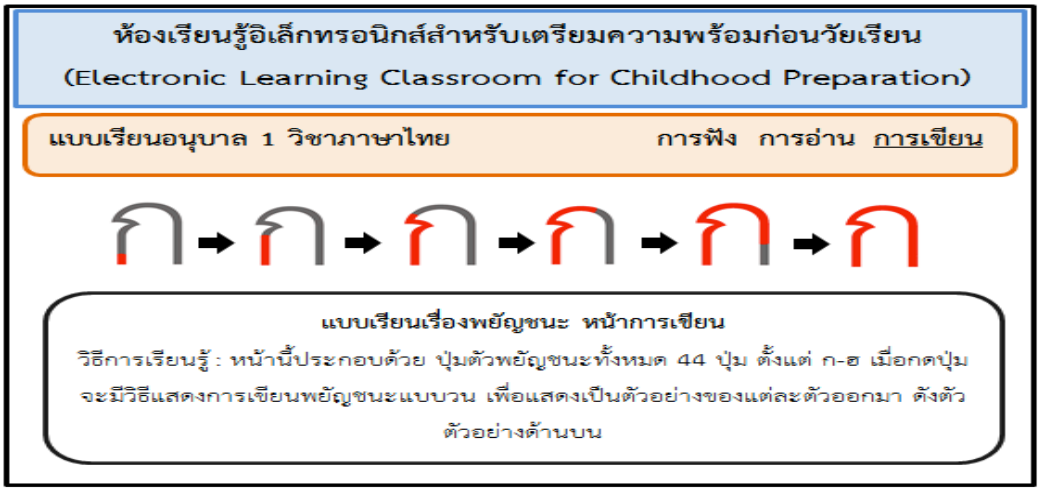

Figure 7: The menu of Thai alphabet writing

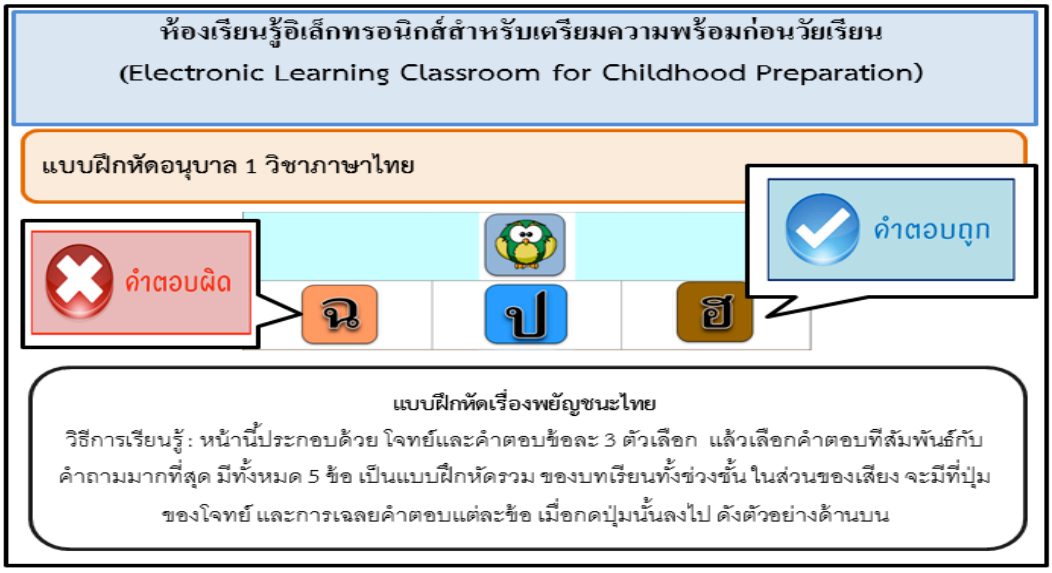

Figure 8: The menu of Thai language exercise

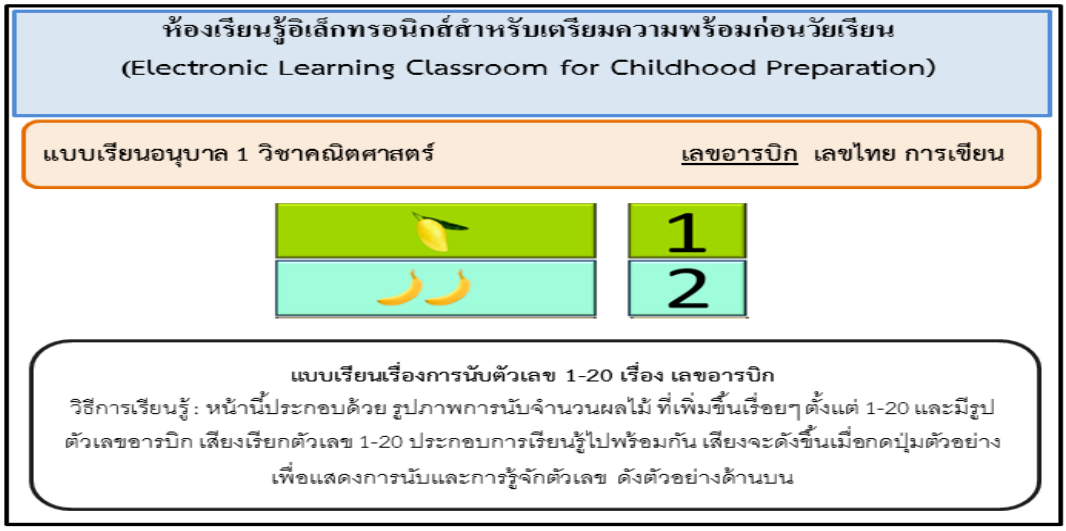

Figure 9: The menu for learning Arabic numbers

Figure 10: The menu for learning Thai numbers

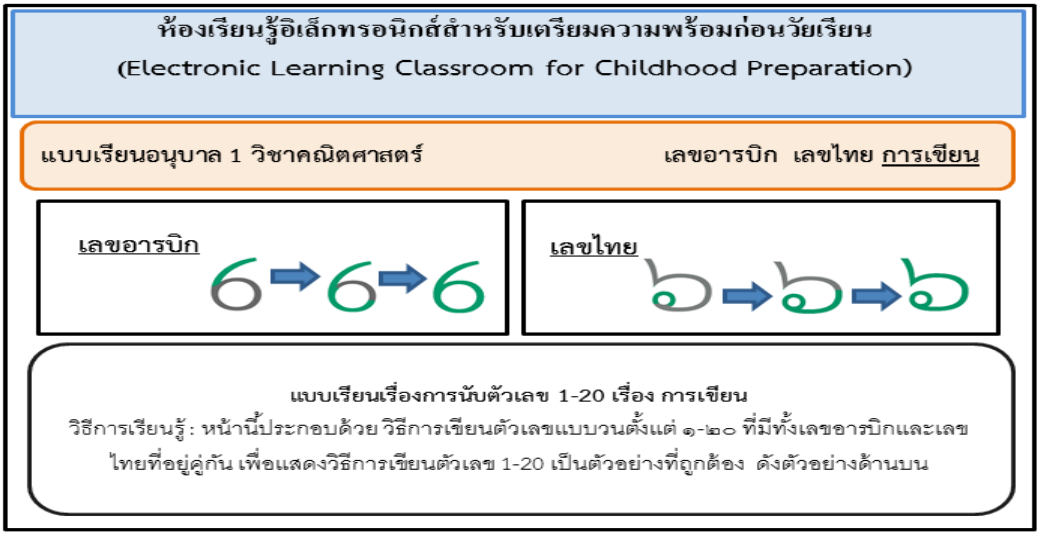

Figure 11: The menu for learning Arabic and Thai numbers

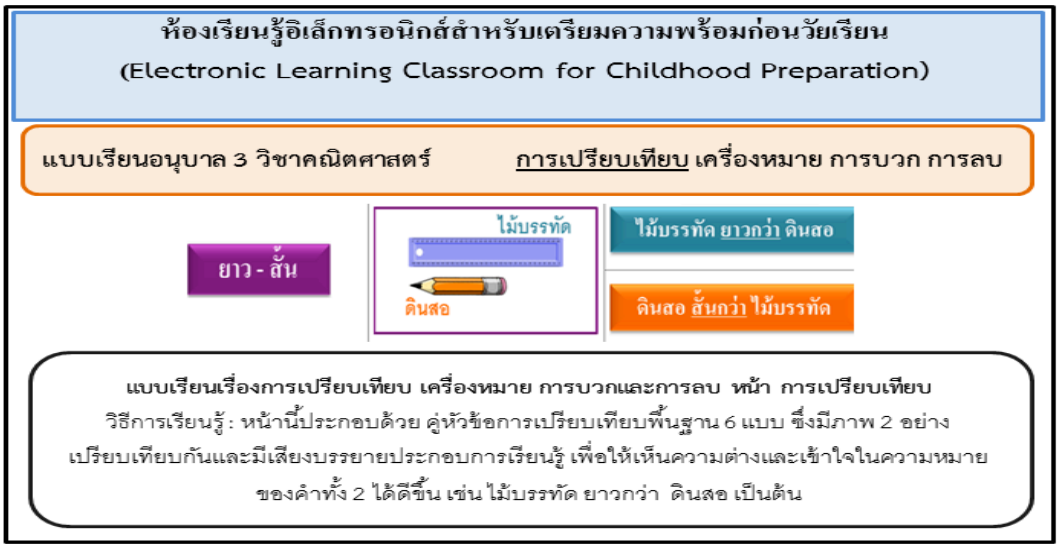

Figure 12: The menu for learning comparison in Mathematics

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Figure 13: The menu for learning relational symbols in Mathematics.

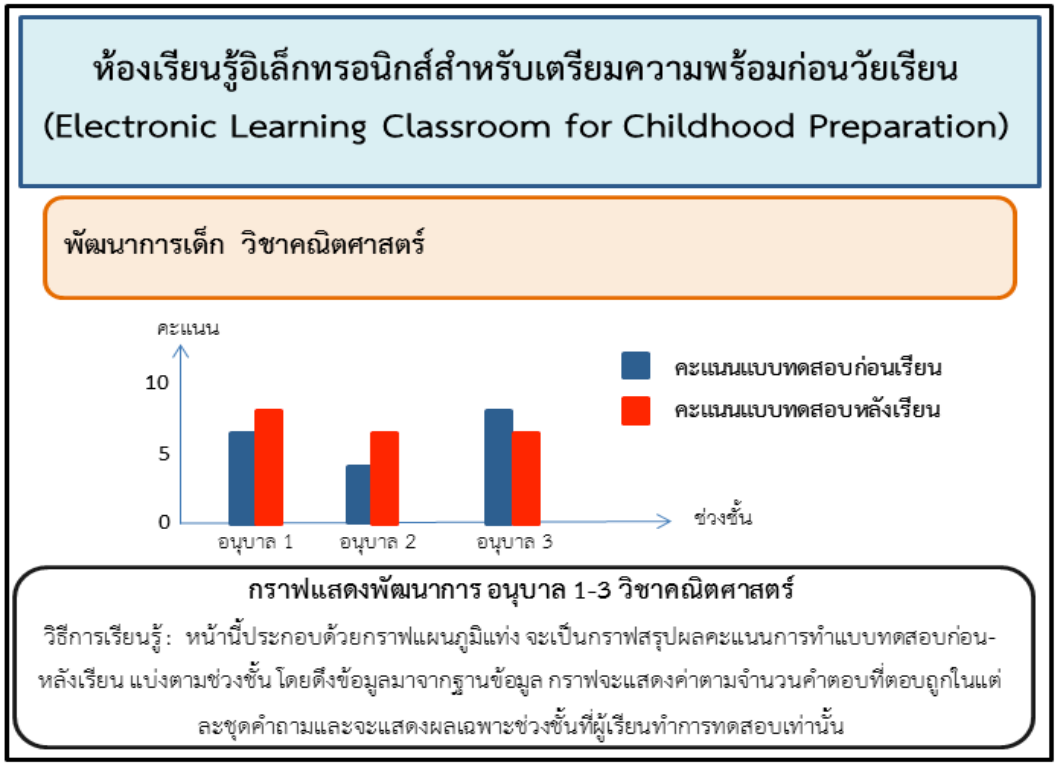

Figure 14: The menu for monitoring learning improvement.

Conclusion

The proposed system aims to support e-learning environments in order to reduce the gap of knowledge among children who starting the first elementary level in primary schools in Thailand. The system should be adopted under parental guidance or assistance. E-learning environments for the system can be in the formal schools or child care centers or at homes. The pilot study consists of two learning areas: Thai language and Mathematics. Each learning area is divided into three levels of preschool learning: level-1 to level-3 and suitable for children of the age from 3 to 5 years. Learning materials consist of learning contents and parents' guide. The pilot study will be evaluated as the empirical evaluation and more learning areas will be added to the system in future.

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