Design of the Information System for Kindergarten Learning Evaluation used Kanban Methodology

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Abstract. This study aims to produce an information system design that helps educators to evaluate learning in each semester systematically and easily accessible. Learning evaluation aims to determine the growth and development of students and see the success of the learning plan. 2013 curriculum is a curriculum that is currently being used by early childhood education. Therefore, it is necessary to design a kindergarten learning evaluation system to then create an information system for learning evaluation for kindergartens that helps teachers know the abilities of their students. The design of this system used descriptive research methods and information system design development methods that use the Kanban methodology, where the Kanban method helps design of the information systems for kindergarten learning evaluation for with the aim of harmonizing development in accordance with the wishes of users, educators who are early childhood education teachers directly in system development. The programmer to then be made by the programmer and used by kindergarten teachers later will use the results of this information system design later. The use of the Kanban method in this study makes it easy for programmers to be able to design their information systems.

1. Introduction
Based on the 2013 Curriculum, there are 3 kinds of kindergarten assessments, namely anecdotes, checklists and works. Assessment emphasizes the potential of students by monitoring learning from progress, results to continuous learning improvements that are carried out when children are playing, interacting with friends or teachers, when children communicate their thoughts through their work and assessments like this are done every day. The important thing that needs to be understood is that the results of the work are not to be judged good or not, but to analyze the progress of the development of tired children. Developmental assessment in early childhood education is not a simple matter because there are many factors that need to be considered when gathering facts, analyzing children’s behavior while playing, and analyzing work. Of course, this is in accordance with the principle of the 2013 Curriculum, which emphasizes that educators are required to make detailed and thorough assessments of each of their students. Constraints that occur by kindergarten teachers are difficulties in processing the evaluation of children's development learning every day in accordance with the 2013 curriculum so that it takes a long time to process it. Therefore, it is necessary to design an Evaluation Information System Web-based kindergarten learning to facilitate educators in recording assessments based on the 2013 curriculum by minimizing the work of educators who have difficulty processing learning evaluations because recording must be done repeatedly in learning evaluation books as many as the
number of students. This system is expected to make it easier for users to find and compile evaluations of learning to be carried out. Learning evaluation data processing will be used as material for consideration whether learning evaluation is in accordance with planned activities.

Many countries around the world have recognized the importance of early childhood education. As facilitators of learning, preschool teachers are expected to plan and provide for their children's learning by using a variety of resources, including information communication technology (ICT). Recent development in the role of kindergarten in children's progress includes the use of Information and Communication Technologies (ICTs) [1]. The term IT refers to digital media or tools, including computers, tablets, multi-touch screens, Internet, digital cameras, audio recorders, and e-book readers [2]. Precisely, ICT use in education can create new educational environments, provide new teaching methods, change the traditional teacher-student relationship and finally improve the quality of education [3]. Additionally, the use ICT at school is an effective way to develop individuals who are proficient in ICT meeting the demands of modern information society [4]. The findings of the study indicated that, although student teachers acknowledge the role of ICT in kindergarten children's development, most of them do not use ICT in their teaching practices [5].

Design of the information system for kindergarten learning evaluation will apply descriptive research methodology and system development using the Kanban method. This is done because the system development process requires management control for each stage of the information system for kindergarten learning evaluation. Kanban has been confirmed as an effective and promising software development method [6].

2. Method

The use of research methods in the research that researcher do was a descriptive method. Descriptive research method is a research method aimed at describing existing phenomena, which take place now or in the past [7]. Descriptive methods are used to find information about materials, procedures, and analysis data related to learning evaluation. The development method for designing an information system for evaluating kindergartens uses Kanban as a management and control guideline at each stage. The pertinent is to continuously achieve more and more successful projects. In the field of software development, the Kanban method has gained momentum recently, mostly due to its linkages to Lean thinking [8]. Richard et al. indicated that Kanban Software development process is more effective than traditional development process [9]. Benefits of Kanban scheduling are reduced inventory (simultaneous WIP), improved flow, prevented overproduction, operations-level control, visualized schedule and management of the process, improved responsiveness to change in demand, minimized risks of inventory obsolesce, and increased ability to manage the supply change [10]. In Kanban system, tangible objects, cards that contain information such as the job type, the quantity of parts to carry, and the Kanban type, have become crucial in production management [11].

3. Results and Discussion

After seeing the description on the introduction, the researcher conducted a research using descriptive research method and found that to design an information evaluation learning system there were several business processes that worked together to support the development of the next stage using the Kanban system development method. The Japanese word Kanban refers to signboard. Kanban system provides many advantages in managing operation and business in the organization [12]. The Kanban method is a method for making a product because it contains effective work procedures to produce the ultimate goal - profit. To get the final goal, of course, it is necessary to adjust to changes in demand without having excess time that is not useful. This is illustrated by the Just in time concept found in Kanban. Just in time, produce a product that is needed, within the period of time needed and the amount needed. Kanban can also be said as a tool used in preparing schedules. In this research, it will be elaborated on how the design of this information system is described on the "signboard" or practitioners often refer to the term "visual card". Visual cards describe cards that are colored as a visual and physical marker in their design activities. Next is the visual card illustrated in Figures 1 – 4.
In Figure 1, the initial stages of Kanban use are shown with a preparation of a schedule consisting of:

1) To do list cards, the purpose of which are tasks and processes that need to be done while designing,
2) On Progress cards, this card indicates that the task -the tasks and processes that are in the do list are ready for design.
3) Review cards, cards that indicate that the tasks and processes designed need to be checked again whether they are in accordance with the wishes of consumers or not.
4) Done cards, a card that indicates that the tasks and processes that enter are tasks and processes that have been completed.

In Figure 2, the next step is shown after detailing the tasks and processes that need to be done in designing. Where it appears that tasks and processes have already begun to be done on the On-Progress card. However, not all tasks and processes are immediately transferred to the On-Progress card. This is because at each work assignment and processes each work schedule has to be adjusted to which tasks and processes have priority first.
Figure 2. Visual Card on Progress

In Figure 3, it can be seen that the tasks and processes contained in the visual card show that there are tasks and processes that have entered the review card and done card.

However, on the review card the tasks and processes can just go back to the previous card, the On-Progress card and the thing to do card. This might happen if the results of each task and processes that are being reviewed are not in accordance with the wishes and needs of the customer, so that repetition of work is needed to get the desired results and needs of the customer. The illustration of returning tasks and processes is shown in Figure 4.
Using the visual card on the *Kanban* method will end when all the tasks and processes are on the Done card. The tasks and processes on the Done card will be evaluated by the product owner. If it is appropriate, the feature can be moved to the production domain (live). Of course, it will be achieved if all the tasks and processes in designing learning evaluation information systems for the kindergarten are in accordance with the wishes of the customer.

4. Conclusion

The conclusion of this study is that the design of information systems evaluating learning using the *Kanban* method can help with the production level synchronization that adapts to customer demand. *Kanban* described in a visual form beforehand allows all people who have a share in the flow of activities and adjust the level of activity according to their needs.

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