Design of the Information System for Kindergarten Learning Plan used Scrum Methodology

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Abstract. The purpose of this study was to design the information system for kindergarten learning plan used scrum methodology. Lesson plans for early childhood education include the development of themes, sub-themes and sub-themes which will then be elaborated through various learning activities including semester program, weekly learning implementation plan (RPPM), and daily learning implementation plan (RPPH) generally still recorded on the notebook. The research method used in this research is Research and Development (R & D) method with research instrument use interview and observation involving educator, that is early childhood education teacher directly. While the method of system development that used in research by using Scrum method, where this method can easily anticipate the level of complexity in the system development process. This research produces a website design that allows educators to plan lessons in each semester. Learning planning at Early Childhood Education based on this website aims to facilitate teachers in planning learning activities tailored to the stages of child development in a systematic, easy and fast in preparing and looking for it.

1. Introduction

Currently, the development and progress of information technology is growing rapidly and has an impact on education aspect. The implementation and development of Information and Communication Technology (ICT) in education has become one of the Ministry of National Education's policies to improve access and quality service to the community [1]. One of them is Early Childhood Education (PAUD) especially in Kindergarten (TK), because the issue of this research is the attention of the community and the researchers to do and disseminate the information [2].

Based on the results of research conducted by Liu, Toki & Pange ICT has been utilized by teacher’s kindergarten in Greece which aims to prepare tools and teaching materials. In addition, based on the results of research conducted by Kara & Cagiltay, technology has been included in the Kindergarten curriculum so that teachers can use ICT [3]. Teachers use ICTs if they are able to operate ICTs in planning lessons [4]. Implementation of learning in early childhood requires a plan for the implementation of the learning process. Planning is a professional task of teachers before the learning process begins in class [5]. In Indonesia, the planning of the learning process in Kindergarten refers to the curriculum of 2013 which is currently used as a national curriculum. The 2013 curriculum-learning plan consists of three plans that include semester program, weekly learning implementation plan.
(RPPM), and daily learning implementation plan (RPPH). Based on the results of observations in the field of third planning is still done manually as typing aspects of child development that will be implemented. This resulted in educators and education personnel having difficulty in planning and organizing activities because it takes a long time in preparing activities for one semester that will be translated back in a week and one day. In addition, at the time of learning educators feel difficult when will see the planning of learning because they have to look into the notebook and result in the assessment of the process will be done after the learning process. Therefore, the web-based PAUD planning system is designed to facilitate the educator who will record each RPPM and RPPH along with the implementation record of the plan that has been formulated. This system is expected to facilitate users to search and organize activities to be performed. The results of each activity will be recorded on the system. Recorded activities will be used as an appraisal of whether planned activities are in accordance with the planning and getting the expected results.

Lesson Planning System Kindergarten will apply research methods using Research and Development (R & D) and system development methodology using Scrum method. This is done because the system development process has a level of complexity. Often users or organizational environments demand a sudden change, which is not anticipated by the development team. Scrum makes a significant difference because the resulting product will be tailored to the environment as the system development process.

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2. Method
The form of this research is a case study with Research and Development (R & D) research method. As well as emphasizing the role of social sciences, it will be seen that design activities are thought to be so intimately related to R&D in services that the concept is best extended to encompass these too. In contrast, the Frascati Manual seeks to sustain the demarcation between the activities. A recent study by RTI for the United States’ National Institute of Standards & Technology also recommends against changing the R&D construct. (This report discusses specific and challenging forms of R&D and processes of innovation in services, with case studies of a set of knowledge- and/or generally technology-intensive services – telecommunications, software, financial, and research, development, and testing services)[6]. Software development process is other wise called as SDLC. There are many numbers of new approaches, SCRUM (Agile methodology) is one of them. Agile consists of many methodologies but SCRUM is most famous and powerful methodology which provides benefit to companies. SCRUM is simple for managing difficult projects. SCRUM is an agile process [7].

Scrum method starts with the premise that software development is too complex and unpredictable to be planned exactly in advance. Instead, empirical process control must be applied to ensure visibility, inspection, and adaptation. Scrum implements this process through three roles: the Product Owner, the Team, and the Scrum Master. The Product Owner is responsible for representing the interests of everyone with a stake in the project and its resulting system. He maintains the Product Backlog, a prioritized list of project requirements with estimated times to turn them into completed product functionality. The Team is responsible for developing functionality. Teams are self-managing, self-organizing, and cross-functional, and they are responsible for figuring out how to turn Product Backlog into an increment of functionality within an iteration and managing their own work to do so. Team members are collectively responsible for the success of each iteration and of the project as a whole [8].

3. Results and discussion
Education is a tool that can develop the ability of children starting from the age of birth. Based on the Law of the Republic of Indonesia Article 1 point 14 No. 20 of 2003 that “Early Childhood Education is a coaching effort aimed at children from birth up to the age of six that is done through the provision of educational stimuli to foster physical and spiritual growth and development in order for the child to
have readiness in entering further education”. Based on this statement kindergarten needs to be considered by various parties such as family, school and community environment, because the ability of children in the future can be determined by various stimuli that are given precisely and meaningfully by the environment around the child [9]. Curriculum development, especially in kindergarten curriculum in Indonesia based on The Permendikbud number 146 the year 2014 about the curriculum of kindergarten in appendix 1, explains that curriculum development is done based on four national standards of education, that is Standard of Child Development Achievement Level, Content Standards, Process Standards, and Assessment Standards. While the reference to the implementation of the curriculum is the Standards of educators and educational staff, Standard facilities infrastructure, Management standards and Standards Financing.

Designing kindergarten based learning planning system website, the author uses Scrum Methodology. Use of Scrum Methodology because Scrum is superior to project management in a practical process model. Scrum formed a project team to inspect the process and make continuous adaptations to control the direction of each process. Project life cycle is the most important thing in Scrum methodology. Scrum methodology consists of 4 stages, namely: 1) product backlog which contains a list of every priority needs of the project or features that include the needs of users of the system, kindergarten teachers. 2) Sprint Backlog is a work unit activity required to meet the needs previously set in the backlog. In designing, this system required three teams of developers consisting of programmer, designer, and tester. Programmer in charge of making the system with expertise in the field of web-based programming, namely PHP and master MySQL database. The designer has the task to design the system interface by mastering the tools used to design and understand in detail the needs of making the system. The tester is in charge of performing system tests previously performed by the programmer and the tester. 3) Scrum meetings, is a routine activity per day to evaluate the work done, the barriers that exist, and completion targets. This meeting activity is performed during the system creation process, especially on interface design. Demos. At the demo stage, the developer team attacks the increment software to the user for demonstration and then evaluated by the user. This stage is not the author do because the results of this research are intended as a system design. Then the design of this system can be used as a reference in making the system.

Here are some page designs on kindergarten learner planning systems. There are several pages: login form, learning planning form, learning planning confirmation form, learning planning approval form, learning plan form, and learning planning form. The login form design is used by the teacher to enter the learning planning system. While the other form design is the contents of the learning planning system which includes the initial process by the admin to provide notification to the teacher to do the tasks that, need to be done by the teacher. After the teacher knows the task that needs to be done to make the learning plan (Figure 1-4).

![Login form design](image-url)
Figure 2. Designing confirmation form for learning planning.

Figure 3. Designing the form-making plan of learning.
Figure 4. Planning the form of the learning plan.

In the above design, results have been found that the design of this application can help and facilitate the kindergarten teachers in designing learning. This is stated by Choen, Paek, Han & Lee (2002. 485; 487) who stated that with web-based, teachers can manage and control all learning plans systematically [10]. In this study, the curriculum database includes the design of learning that includes themes, preparation and learning objectives that are connected to each other to facilitate teachers in designing learning. The lesson plans are designed based on a curriculum built using web-based simplicity in designing learning to be easier and faster, as well as in compiling and searching for it.

4. Conclusion
Implementation of the design of learning planning system can help in facilitating learning activities, especially teachers of kindergarten. Kindergarten teachers can easily identify any planned activities in the semester program, Weekly Implementation Plan (RPPM), and Daily Learning Implementation Plan (RPPH) because the system has been notified of what activities should be done by adjusting to the learning plan. Implementation of the system also helps teachers in saving the use of time that previously sought out the lesson plans in the lesson plans and in preparing the learning media.

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