Design Support System for Open Distance Learning Student Teamwork

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Abstract. Open distance learning students in doing team assignment, they seldom face to some problems such as student fell unfair in numbers of workload contribution, instructors also do not know which students do more work than others. So there are some questions ie: how to connect between instructor, team members, and working documents. Methods will be used are first, analyzing current condition and last by designing systems to connect between instructor, team members, and document. The expected result is support systems for open distance learning student teamwork.

Introduction

Background

Indonesia is a country in Asia that have more than 14.000 islands. A lot of islands are not supported by the internet, online learning in Indonesia is necessary for improving higher education [1]. Education Institutions who running e-learning have Learning Management Systems to help instructors and students can connect each other’s [2] [3]. In Learning Management Systems provide subject content materials, assignments, and discussion forums [2].

To support Open Distance Learning need a small group discussion, students will have active learning habits, and students will be more understandable in learning [4][5]. Doing teamwork must have aesthetic rules. From Buddha way, there are some rules i.e. talking right, doing right, working right, and trying right [6]. Students also do not want to be considered telling untrue about their job from his team members. Falsification and astray thought are also not considered right for teamwork [7].

Informal conversation on Social Media such as Whatapps, Line, Twitter etc. can provide student learning information [8].

In doing assignment especially in a small group, students are seldom faced problems i.e.: student have teammates who get only a few work contributions, and instructor confused to get information which student have more work.

Previous Research

Open and Distance Learning Education

Open and Distance Learning Education is an alternative education method that geographical between instructors and students are apart, and need a medium tools to send messages or study content material from instructors to students [9].
E-Learning tools
In running distance learning education, institutions must have e-learning tools. And some institution educations are not prepared deploying e-learning tools [10][1]. Education Institutions who running e-learning have Learning Management Systems to help instructors and students can connect each other’s [2][3]. In Learning Management Systems provide subject content materials, assignments, and discussion forums [2].

Distance Learning Characteristic
Distance Learning characteristic is a separation geographic between instructors, learners and also instruction system which need some medium to work as a tool that can be used to send messages or subject learning between learners and instructors [9].

Higher Education Distance Learning Medium
Medium in Distance Learning Higher Education that can be used are i.e.: printed medium (such as book, module, or learning rules), digital medium (such as audio, video, radio broadcast, television broadcast, interactive video, computer, VCD) [9].

Group
Group definition is two or more people interaction who have specific goals. There are 2 kinds of group i.e. formal group and informal group or people often call social group [11].

Group development phase
Group development can be passed in 5 (five) steps [11]: 1. Forming phase. There are two forming steps : i. The first step, people join in a group, ii. Next step, the decision to a directed goal, structure, and leadership. 2. Storming phase. In this phase, there are some clashes, and toward an agreement. 3. Norming phase. Norming phase is a phase that a relation and cohesion of a group be one. In this phase, there will be constructed a same expectation set or norm on team member behavior. 4. Performing phase. A phase where group structure accepted by team members. Energy also toward to understanding of each work and each member work on group goals.

Challenge Group Management
Challenge on manage group is drawbacks and benefits [11]. Drawbacks or retreats : do not like team member, do not trust team member, stereotyping team member, communication problems, stresses and pressures. Benefits : differ and diffuse idea, limitation group thought, improve focus or understand from other ideas or views.

Methodology
Field study research. Researcher will find institution which run distance education in Indonesia, The analysis and design method that will be used are Object Oriented Analysis and Design (OOAD). On analysis method show about how is student doing team assignment in current condition. On design are shown use case diagram, activity diagram and user interface.

Result and Discussion
Current Condition Analysis
There are two types of assignments, the first type is personal assignments, and the second type is team assignments. In next, the paper only discusses team assignments.

Assume students can be from different islands in Indonesia, i.e. student A from Java Island, student B from Borneo Island, and C from Bali Island, and the instructor from Jakarta, in Java Island. After they finish their assignment, one of them sent their assignment to current learning
management systems. And the instructors take their assignment through learning management systems.

![Image](image1.png)

**Figure 1. Teamwork Distance Learning Education Systems**

Students in doing team assignment, will follow steps such as:  

- a. Students join in a group. They determine their team members  
- b. Students accept / take team assignment  
- c. Students share their workload  
- d. Students do their own workload team assignment  
- e. One member of team submits their team assignment and send to instructor through learning management systems

![Image](image2.png)

**Figure 2. Current team assignment flow**

Students do their own work in their places that separate geographically. After every team member finished their own assignments, then they combine to be one and submit to their instructors.

Some problems occur:  

- a. students do their workload but do only a part of their assignments,  
- b. students do their work more than others,  
- c. students submit to team member late, over deadline set by team.  

Those problems cause:  

- a. students feel his workload more than others,  
- b. students feel grade given by their instructors are not fair,  
- c. instructors only know and give grade according to submitted assignments.

**Student Teamwork Support System Design**

To support teamwork process, there needs Team Leader menu, to choose a leader of the team. The team leader will determine types of teamwork will be done. 2 (two) types of working process: (1) Relay assignment or (2) Parallel assignment. Relay assignment to support a kind of assignment that will be run look likes relay race that passes over a token. Parallel assignment to support the assignment that has parallel work.
There are some features to support the systems: 1. A menu that provides types of team assignment: relay and parallel assignment. 2. A file storage feature, a place to store their teamwork files. 3. A social media feature, a place where a social media will be used to communicate. 4. A contribution feature, where instructors can see how much their team members contribution in doing their assignments.

Team leader creates team and enters the name of team members. Leader choose the way assignment will be done, by relay or by parallel. Leader create the name of working file. Leader choose storage to put the working file. Leader defines an application of social media. Members will have discussion in social media. After team submits the assignment, instructor see their work contribution. Use case diagram will be shown on figure below.

![Use case diagram for Teamwork Support Systems](image-url)

**Figure 3.** Types of team assignment

Team members choose one of team members as leader. The leader entry team leader name and its members. Leader choose kind of assignment whether relay or parallel. Team leader entry storage media where to put working files. Leader create working files, and give name on the working files. Leader divide assignment workload to all member of the team. Leader entry the name of social media that will be used for communication among them. Every member does their job according workload that has been divided by leader. Every member has chance to review their mate jobs. One of team member submit the assignment to instructor. Instructor can see the score of member’s contribution.

**Figure 4.** Teamwork Support Systems Use Case Diagram
User interfaces are created from proposed activity diagram “contribution”. Instructor can see student activity, and score can be get from it.

Algorithm to get the score:
If submission date > submission dateline then

\[
\text{Score} = \text{Score} - \sum_{i=1}^{a} L_i
\]
If \(x > 0\) then
\[
\text{Score} = \text{Score} + \sum_{i=1}^{x} C_i
\]
endif
end

Figure 5. Proposed Teamwork Support Systems Activity Diagram

Figure 6. Student Activity Log User Interface
Legend:
\[ n = \text{number date of late submission} \]
\[ x = \text{number of contribution} \]
\[ L = \text{score addition for late} \]
\[ C = \text{score addition for contribution} \]

Conclusion
The student teamwork support systems for ODL will solved the problems: 1. instructor will know addition scores to their assignment from number day of late submission and number of contribution, 2. team members know who work and submit the assignment earliest and on schedule given by team leader. 3. The contribution score can be added by number of contribution (C) and subtracted by number of late submission date (L).

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