Adapting Learning Activities: a Case Study of IMS LD based Script and Tooling

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(Applying for competitor role)

Identification data

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Which modeling language are you going to use for the CSCL scripts?

IMS LD

Which tools are you going to use for the operationalization/instanciation and execution of the script (i.e. transformation of the script into an actual running activity)?

Our model will be executed using the TENCompetence Project Infrastructure

Are you going to work with the proposed case study?

Yes

Which adaptation issues have you planned to deal with?
Choose in the list below the issues you will tackle and describe the example on which you will illustrate it (related to the case study you have chosen).

All adaptation issues described in the list are considered (see below).

How will you tackle these issues?

Provide a few lines explaining what are your approach and your proposals to handle the problem of adaptation within the considered issues.

☐ **Predefined adaptation**

A local personal property is defined for each student to express his/her learning interest. Two options are defined in the model: water and renewable energies. At the beginning of the individual work phase, each student has to make a choice from the options. After that, s/he will be guided to answer a list of questions according to her/his choice. The model uses condition clauses to control the visibility of activities step to step for each student till the student answers all theme-relevant questions.

The students can have different paces to answer the questions. That is, if a student responses a question, the following question will be presented without the need to wait for other students completing the same activity. IMS LD allows the participants to have different paths and paves. In fact, each role-member (one user may play one or more roles in a learning process) has an independent thread in an instance. In addition, an answer-dependent branch is also designed. If a student can't answer a question correctly, s/he will answer an additional question to detect misconception. However, the students who response correctly will be exposed to a more challenging question. The branch is implemented as a condition clause as well.

☐ **Adaptation "on the fly"**

    ☐ **adaptation of the learning flow without modifying the scenario**

A monitor service is designed in the model for the teacher to monitor the work progress of every student through observing the student's scores. A Boolean type property is defined for the teacher to control the learn-flow of the student being monitored. If it is set "true" by the teacher at any time (or as described in the case, a student may be still pondering on the first question whereas the other students are on the last one), the student will jump to the last question. Such a jump is controlled by a conditional clause. If the Boolean-type property is "true", then the activity to answer the last question will be presented to the student and the intermediary questions will be skipped.

    ☐ **modification of the operationalisation/instanciation data**

As mentioned before, each role-member has an independent thread in a run (instance). A late-comer can start and carries out her/his work independently from others' work progresses, no matter whether others are still answering questions or are currently involved in the discussion phase.

IMS LD run-time environment allows adding a new-comer to an executing instance and assigning a role of the instance to the new-comer. After that, the new-comer can register to the instance and work from the beginning or directly join a discussion according to his learning interest.

    ☐ **modification of the scenario**

Current version of IMS LD run-time environment does not support to add a new role definition in an executing instance. It is an issue to dynamically change a process model definition and/or an instance of a process model (the change only effect within the instance and has no affect on other instances of the same model). Current version of IMS LD run-time environment can only support predictable adaptations. For example, we model the scenario in a way that the role "expert" is predefined and the properties concerning the expert are predefined as well. If necessary, the teacher can input information about an expert (e.g., email address) at run-time and send a notification to the expert by email. Then the invited expert can register to the instance and join the activity.

☐ **Other**

We designed two discussion groups for two themes. The memberships of the groups are not pre-defined, but are adapted to the selected learning interest. However, with IMS LD, it is also possible to model the user-involved adaptation. For example, the teacher assigns a student to a discussion group at run-time. In fact, the property can be used to represent any information in IMS LD. Thus, not only personal characteristics and learning design components (e.g., learning activities and learning objects), but also a wide range of adapting factors and adapted objects can be represented. For examples, if today is working days, then show environment1 else show environment2; If today is weekend, then show information "please come on working days, because no service is available on weekend", else show information "the service is available in environment1".

Which related observation problems will you tackle?

If you have planned to tackle observation problems, please describe briefly which ones, the related adaptation issues, and your solution for handling this problem.

In IMS LD, different types of properties can be used by the engine for automated adaptation. Because the values of various types of properties can be viewed by participants, the participants can take various actions that may trigger events for further user-involved and/or automated adaptations.

The global properties can be used to capture information (e.g., chat protocol) produced in instances and then can be retrieved later on by the engine and the analysts.