Script-aware Monitoring Model: Using Teachers’ Pedagogical Intentions to guide Learning Analytics

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Overview

- Context and motivation
- Research goals
- Script-aware monitoring model
- Conclusions
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• Research goals
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• Conclusions
Context

Research on **CSCL & TEL**
- Focus on (non-expert) **teachers**
- Focus on learning **design / CSCL scripts**
- Focus on higher education (but also primary)

M. J. Rodríguez thesis …

- **2011**
- **2012**
- **2013**

Middle stage
Context
Computer Supported Collaborative Learning

Teacher-oriented approach

CSCL situation life-cycle

[Gómez-Sánchez et al., 2009]
One of the main concerns: enhance collaboration

Diagram:
- Design
- Evaluation
- Enactment
- Instantiation

Scripting
However, despite using scripting ...

Hmm, we could try with a brainstorming by pairs ...

... eventualities may happen

Having a plan is not enough ...
Monitoring can help to know what is happening

[Monitoring]

[Soller et al., 2005]
However, monitoring approaches... 

Being aware of the participants' behaviour when diverse ICT tools are being used in the classroom... is time consuming and error-prone.

Analysis effort
- 2 students, 1 tool
- 1 group, 1 tool
- Whole class, 1 tool
- Whole class, several tools

Amount of data

Teachers need a more global view about what is happening / has happened.

... often do not satisfy teachers' needs.
Synergies may appear when combining scripting and monitoring ...

... however, the integration is not straightforward (Martínez-Monés et al., 2011)
Besides ... the complexity of current CSCL scenarios hinders orchestration.
Teachers need monitoring tools for orchestration of blended, scripted CSCL scenarios supported by DLEs.
Overview

- Context and motivation
- **Research goals and expected contributions**
- Script-aware monitoring model
- Conclusions
Main Goal

Provide **non-expert teachers** with design and enactment support capable of **linking pedagogical intentions** with monitoring needs for orchestrating blended **CSCL** scenarios in distributed learning environments.
Partial objectives

Support non-expert teachers/designers to identify and include the monitoring issues throughout the design process of CSCL activities.
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Provide teachers with coarse-grained information about the evolution of the CSCL situation, based on the constraints obtained from the script.
1. Support non-expert teachers/designers to identify and include the monitoring issues throughout the design process of CSCL activities.

2. Provide teachers with coarse-grained information about the evolution of the CSCL situation, based on the constraints obtained from the script.

3. Support the automation of the data gathering and integration tasks in CSCL DLEs.
Expected contributions

- EVALUATION
- ENACTMENT
- INSTANTIATION
- DESIGN

Monitoring
- Design-aware monitoring process

Scripting
- Monitoring-aware learning design process

Architecture for monitoring DLEs
Expected contributions

EVALUATION

DESIGN

ENACTMENT

INSTANTIATION

Scripting

Monitoring-aware learning design process

Architecture for monitoring DLEs

Design-aware monitoring process

Monitoring
Overview

- Context and motivation
- Research goals
- **Script-aware monitoring model**
- Conclusions
Script-aware monitoring model

• Method followed:
  1. Analysis of modelling approaches
     • Goal: Identify elements relevant to scripting and monitoring
  2. Pilot studies
     • Co-design experiences with teachers in real scenarios
     • Goals:
       • Identify attributes needed to answer teacher monitoring interests
       • Test the usefulness of the overall approach
1. Review of modelling approaches

CSCL scripting

Activities
- Groups
- Participants
- Roles
- Resources

[Weinberger et al., 2009
Dillenbourg & Tchounikine, 2007
Fischer et al., 2007
Kollar et al., 2006]
Script-aware monitoring model

1. Review of modelling approaches

- [Weinberger et al., 2009]
- Dillenbourg & Tchounikine, 2007
- Fischer et al., 2007
- Kollar et al., 2006

[Harrer et al., 2009]
Roles play Participants

Participants belong to Groups

Actions involve Resources

Resources are supported by Activities

Activities conform dependencies
Script-aware monitoring model
2. Case-study

- Co-design with a CSCL-design experienced teacher
- Two loops of the CSCL life-cycle were enacted
- Research goals:
  - Identify elements and attributes of the model
  - Collect initial impressions of the teacher after completing the lifecycle
Script-aware monitoring model

Attributes

Roles play Actions

Participants belong to Groups

involves conform dependencies

are supported by

Resources Activities

Formation policies
Script-aware monitoring model

Attributes

Roles play Participants belong to Groups

Actions involve conform

Resources are supported by Activities

Deadlines

Interactivity type

Social level

Dependencies
Roles play Participants belong to Groups

Actions involve

Resources are supported by Activities

Deadlines
Interactivity type
Social level

Formations policies

Expected use dependencies
Script-aware monitoring model

Attributes

- Roles
- Participants
- Groups
- Action type
- Actions
- TimeStamp
- Resources
- Activities
- Expected use
- Deadlines
- Interactivity type
- Social level

Relationships:
- Roles play
- Participants belong to Groups
- Actions involve
- Actions conform
- Resources are supported by Activities
- Activities depend on dependencies
During the period set by the **deadlines**, and according to the **social level**, is there any evidence of the specified **interactivity type** from the monitored actions?
During the period set by the deadlines and according to the monitored actions, does the evidence show that the participants are using the resources as expected?
Script-aware monitoring model

The model in use

- Example of feedback given to the teacher in the pilot study: [http://www.gsic.uva.es/~chus/MASUP](http://www.gsic.uva.es/~chus/MASUP)
Teachers’ feedback

- Preliminary feedback from 3 pilot studies:
  - Specifying the attributes for monitoring required little extra effort
  - The feedback helped to confirm that students were following properly the script
  - Unexpected situations could be detected on time
  - Some “false alarms” were raised by the system, but this was not considered to be a problem
  - The monitoring process enabled by the system was useful and efficient
Overview

- Context and motivation
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- Final remarks
Provide non-expert teachers with design and enactment support capable of linking pedagogical intentions with monitoring needs for orchestrating blended CSCL scenarios in distributed learning environments.

Methodology
- Design-based research

Evaluation
- Evaluation with experts
- Case studies in CSCL scenarios
Thank you very much!

Questions? Comments?

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