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System log data is a step-by-step recording of user interaction with a software program. The level of detail recorded is determined by a purpose-built program and can include mouse clicks, menu calls, and all operations on objects. Modelled on a 'record' facility, log data is a useful way of tracking user preferences and navigational choices.

### Uses – some example situations

- ◆ Any evaluation looking at how students work with courseware
- ◆ Learning evaluation: for triangulation with other data sources, e.g. questionnaire responses, interviews, focus group discussions, course grades, observation reports
- ◆ Usability evaluation: as an objective means to track use patterns, errors, navigation paths and time on task

### Process involved

#### 1. Plan

The purpose of the evaluation will determine what data needs to be logged, how it should be recorded and summarised. The evaluation plan provides the specification and level of detail for establishing the logging process. This may be 'high level', e.g. number of logins and time on task per student, or 'low level', e.g. key strokes, mouse clicks, navigation choices and frequency of errors. Logging is done by a program running on the server from which the courseware is accessed.

#### 2. Data Collection

Raw data from the logging process is imported into a statistical package such as SPSS, StatView or Excel, then sorted into categories defined according to purpose, e.g. as individual student, group or functional profiles. Too much rather than too little data, and flexible format for output are good principles, as it is difficult to anticipate significant but unexpected results. It may be easier to deal with some redundant data than to modify the logging program during the evaluation. Statistical tests can be applied if appropriate, and emerging patterns may feedback into an iterative courseware design process and be used for triangulation purposes, or be the focus of further evaluation.

#### 3. Reporting

In the final analysis, conclusions are drawn from or supported by system log data. Statistics are available for reporting purposes, and graphs, charts etc are easily produced. The data sets may also be used as a basis for comparison following modifications to courseware or to supporting environments. Graphs produced from log data show trends in a form that is easy to read and interpret. Statistical packages make this, and application of various tests, a simple task.

### Variations of this technique

Log data can also be used to evaluate an integration strategy, i.e. do statistics show that courseware is being used as anticipated? If it is not used as expected, then other means may be employed to investigate the situation.

Log data is an objective measure which produces reliable statistical data related to a range of issues such as use patterns, usability, integration strategies and perceived usefulness of courseware. However, it does not answer 'why' questions and further evaluation is necessary to find explanations for occurring phenomena.

Careful planning is required as nothing can be captured 'after the event'. The major task is setting up the system to record the precise level of detail required.

Use statistical tests only where numbers and circumstances justify.

#### Other Relevant Pages

##### Recipes

- Questionnaires
- Interviews
- Focus groups
- Observation techniques
- Trials
- Resource questionnaires
- Checklists

##### Information Pages

- Statistics questions
- Pedagogical toolkit
- Student sample
- Working with groups

##### References