

# Glossary

## **Active reading**

A way of reading where the reader actively working with the text by adding notes and drawings, using the text for searching for relevant material, analysing the structure of the text, keeping track of the activities, and so on. The text is the mean for knowledge in active reading and not the goal.

## **Adaptable feedback**

Allowing different learners to receive different feedback information. Different types of feedback are provided gradually or the amount of the provided feedback is gradually increasing, depending on learners' individual characteristics such as knowledge level, interaction behavior, and gender.

## **Adaptive educational hypermedia systems**

Educational systems which reflect several features of the learner in the learner model and apply this model to personalise the content presentation and sequencing, navigation recommendations, feedback given, and problem solving support, based on specific pedagogical rules. The learner model usually represents characteristics of the learner which are relevant to learning, such as goals, knowledge of the domain, experience, preferences, and learning/cognitive style, and it is used in conjunction with a model of the target domain to enable the system adapt the interaction to suit the learning

needs of the individual learner. Different levels of adaptation have been adopted, depending on who takes the initiative, the learner or the system: (i) adaptivity, that is, the system adapts its output using some data or knowledge about the learner in a system controlled way and (ii) adaptability, that is, the system supports end-user modifiability providing learners control over several functionalities.

### **Adaptive feedback**

Allowing different learners to receive different feedback information. The adaptation of feedback is based on the structured form of the feedback supported, that is different types of feedback are provided gradually or the amount of the provided feedback is gradually increasing, and/or on learners' individual characteristics such as knowledge level, interaction behavior, and gender.

### **Adaptive hypermedia**

Hypermedia systems that build a model of the goals, preferences, and knowledge of each individual user and use this model throughout the interaction with the user in order to adapt to the needs of that user.

### **Adaptive instruction**

A primary principle of adaptive instruction is that no single instructional strategy is best for all learners. Consequently, in this form of instruction the pedagogical procedures are adapted or accommodated to the learners' individual differences in order to enable learners achieve learning goals more efficiently. Adaptive instruction aims to: (i) individually support learners to accomplish learning goals in a way that matches their knowledge and approach to learning and (ii) enable learners manipulate and accommodate instructional approaches to their own needs and preferences.

### **Adaptive methods**

Methods describing what is adapted in the learning interaction, to which features of the user the learning system adapts and why (which didactical model) the system implements.

**Adaptive navigation support**

Adaptation at structure level, which helps users to find an appropriate path in a hypermedia system.

**Adaptive platform**

General-purpose adaptive systems that allow the production of courseware for more content, strategies, and interactive behaviours.

**Adaptive presentation**

Adaptation at content level, which is to adapt the page content to knowledge, goals and other characteristics of an individual user.

**Cognitive ability level**

Representing the high order thinking abilities and the underlying cognitive processes typical of the individuals classified by the Ross Test based on Bloom's Taxonomy. It is important to mention that the cognitive abilities refer to organized modes of operation in dealing with materials and problems and do not require specialized and technical information from the learner.

**Cognitive tools**

Mental and computational devices that support, guide, and extend the thinking processes of their users. Cognitive tools can be understood as artefacts that in some sense make the cognitive work easier—in a similar way that a hammer makes it easier to tighten two boards.

**Collaborative mobile learning system**

The support for a learning activity distributed in time, space, and between different people cooperating on a learning subject and tasks.

**Concept drift**

Changes in the target concept induced by changes in the distribution underlying the data.

**Concept map**

A graphical representation of knowledge to represent meaningful relationships between concepts in the form of propositions. A concept map is comprised of nodes, which represent concepts and links, annotated with labels, which represent relationships between concepts, organized in a structure (e.g., hierarchical or non-hierarchical) to reflect the central concept of the map.

**Concept-relationship-concept**

A proposition, which is the fundamental unit of the map. Also, a concept map may include cross-links, which are explicit relationships between or among concepts in different regions or domains within the concept map, and examples clarifying the meaning of a given concept.

**Contextualized learning**

Embedding learning activities in user specific situations and adapting the learning activity to the learner context.

**Courseware**

Computer software designed for educational or training purposes.

**Design methodology**

An indication of the main steps a well-shaped design process should go through in order to produce a complete and sound design for a specific type of object, along with guidelines and tools for completing each step.

**Dominant meaning**

The set of keywords that best fit an intended meaning of a target word.

**Feedback**

Guidance to (i) assist learners in identifying their false beliefs, becoming aware of their misconceptions and inadequacies, and reconstructing their knowledge; (ii) help learners to determine performance expectations, identify what they have already learned and what they are able to do, and

judge their personal learning progress; and (iii) support learners towards the achievement of the underlying learning goals/outcomes.

**Information filtering**

The way to sort information through large volumes of dynamically generated contents and present to the user those which are likely to satisfy his or her information requirement.

**Information value**

Every piece of data has a value, and when data is perceived it is assigned an actual *information value* by the recipient. A common conception is that the information value is a constant attribute—a perceiver has once and for all assigned a value to a particular piece of information—but in fact, this is not really true. The information value for most information is changing all the time, in an information life cycle.

**Instructional design**

The process of (i) deciding what methods of instruction are best for bringing about desired changes in students knowledge and skills for specific course content and a specific student population; (ii) of developing an instructional plan that implements such a method in a viable and sustainable way. The result of instructional design is an architect's blueprint for what the instruction should be like.

**Instructional strategy**

A method for promoting and supporting a specific learner population to achieve desired learning outcomes. Instructional strategies are rooted into teaching and learning theories, build on the abilities of the instructor and take advantage of available learning tools.

**Interface metaphors**

Guiding the interaction of the users with the graphical user interface of a computer software and provide spatial, temporal, or functional orientation. To make use of an interface metaphor, users need to transfer their knowledge about Gestalt, structure, and/or interaction principles of the metaphor's domain into the application domain. A prominent metaphor is the "desktop" of current graphical user interfaces.

**Knowledge worker**

A knowledge worker is a person interacting principally with data, information, and knowledge as working objects, often working with these in both the physical world and the virtual world (digital information spaces), and sometimes in the borderland between them. Common work tasks are to create, search, refine, and mediate data, information, and knowledge.

**Learner control**

An alternative procedure for accommodating instruction to the learners' individual differences. Learners are allowed to take varying levels of initiative and direct their own learning experience. Learner control can be considered as the degree to which individuals control the path, pace, and/or content, approach of instruction.

**Learning sciences**

A field that explores learning across diverse educational contexts, including both formal classrooms and informal settings like after-school programs, families, and communities. Learning sciences research is a multidisciplinary social science field that is grounded in the cognitive science. There are two main themes in learning sciences research: the influence of technological scaffolds on learners and learning environments, and the interplay of collaboration and social context on learning.

**Learning styles**

The different ways a person collects, processes, and organizes information.

**Learning technologies**

Computational media that are designed to support or scaffold learning along various cognitive, metacognitive, and collaborative dimensions in the context of an overall learning environment.

**Learning trajectories**

Representing the navigational behaviour of individuals belonging to a Cognitive Abilities Level class.

**Machine learning**

An artificial intelligence field concerned with the development of algorithms and computer programs which acquire knowledge about their operating environment and learn to automatically improve with experience.

**Navigation metaphors**

Interface metaphors that are used to support navigation in hypermedia systems.

**Online test**

Assessment tools in Web-based education. The most common use of online test is the situation where the students take a computer-based test and their answers are automatically recorded and graded. Results of online tests are frequently used to update the student model in a personalized learning environment.

**Predictive modelling**

A technique used to predict future behavior where some data is collected, a statistical model is formulated, predictions are made and the model is validated (or refined) as additional data becomes available.

**Scrutable**

The system is designed so that the user can scrutinize it when they wish, meaning that the user can determine what has been adapted, what processes caused the adaptation and what information they used for the adaptation processes.

**Sharable content object reference model (SCORM)**

A set of technological specifications for designing Web-based learning materials. It defines how single learning objects are combined on a technical level and sets conditions for the software needed for using the content.

**Student modelling**

The construction and maintenance of a student model to support personalized learning environments in adapting to specific aspect of student's behaviour.

**User control**

The user can control the adaptation that the system performs in personalized systems.

**Web-based learning**

Any learning, training or education that is facilitated by the use of Web technologies. Learning content is stored on a Web server and learners access the content by using widely used network technologies such as Web browsers and the TCP-IP network protocol.