

Introduction to the Detectable Activities for Retainable Transmission (DART) Scheme

Doosub JAHNG

Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology

Overview The sender-receiver configurations, methodologies, and educational tools of information transmission, while building on traditional basic concepts and procedures, are undergoing deep transformation. It is in this context that we propose the Detectable Activities for Retainable Transmission (DART) system of procedures and tools for rendering visible the transmission of information from the perspective of learning, to support the transmission cycle comprising the preparation and transmission of information, determining the state of reception, and sequential learning (e.g., supplementation and repetition).

Key words: system, keyword, retention, sequential learning, learning assessment, educational tools

1. Development background and objectives

The sender-receiver configuration for transmission of knowledge and skills has gone through many changes over the years, from many-to-one (special education of an absolute ruler by many experts) through one-to-one configuration (education of privileged class member by a tutor), and more recently to one-to-many (education of a student group by a faculty member). Today, the Internet adds a new spatial venue to the traditional physical venues and again enables the traditional learning configurations of many-to-one (learning by an individual accessing information online), and many-to-many (team learning online). Digitization has also added new educational tools with the development and proliferation of media that are neither paper-based nor oral, and the continually increasing range of channels and choices for information transmission.

Despite these changes in transmission configurations and educational tools, what is still being emphasized in information transmission settings is the series of learning process involving preparation, transmission, confirmation of transmission, supplementation, and repetition.

The objective of our study was to merge traditional and new learning configurations and to propose a system for this purpose, consisting of information transmission focused particularly on its retainment by the learner.

2. System structure

As shown by the process flow in Fig. 1, Detectable Activities for Retainable Transmission (DART) is a system for retainment-oriented information transmission. It essentially comprises

the following: (1) transmission cycle between teacher and learner; (2) transmission interference preventives; (3) transmission preparation methodology; and (4) relevant tool groups.

(1) The transmission cycle is a temporal series involving prepare, set, and feedback by the teacher (sender) and reporting and perusal by the learner (receiver), performed for each class and throughout the course.

(2) Transmission interference preventives include the traditional measures, together with measures for the creation of keywords with readily retained form and content, creating a set of multiple sub keywords corresponding to each main keyword.

(3) The transmission preparation methodology comprises the five aspects of transmission mode: ways of explanation, examples, story frame, keywords, and length of time (Jahng, 2003).

(4) The relevant tool groups comprise: (4-1) Key Words Meeting (KWM) papers, files, and a web system for the transmission cycle (Kurishima et al., 2012); (4-2) multi-screens for simultaneous projection and expansion of the content of all materials transmitted for the class session; (4-3) table whiteboards on which each team can write keywords over the course of their own discussion and then hang on the wall for interteam comparison and discussion; and (4-4) keyword maps which summarize on one sheet the keywords used by the class (Jahng, 2014).

3. Investigations of system validity

Trials have been conducted on aspects such as: the effects of the DART tools on learning orientations (Jahng, 2014); the relationship between keyword retainment and performance on

examinations and assignments (Wagatsuma et al., 2015); and transmission assessment based on measures of learning activities and teaching activities (Jahng et al., 2015). Experiments are now in progress on aspects such as: the form of highly-retained keywords, the relationship between the time of reporting of keywords retained post-class and their actual level of retainment; and the relationship between the viewing of the teacher's feedback in terms of timing and the number and results of examinations.

4. Discussion

The DART system originated during a period marked by a growing sense of insufficient elucidation of information transmission from teacher to learners and supplementary content to learners, however requiring and assuring commitment to a behavior change of learners in the conduct of learning. The on-site educational effectiveness, which constitutes an essential form of information transmission, was generally measured in the short term by the results of immediate test scores, behavior change, and class performance and in the longer term by subsequent success in career building (Suskie, 2010). Development of the DART system is based on an

understanding of these trends together with the recognition of the need for verification of actual information transmission in the learning process accompanying feedback to learners regarding supplementation activities where necessary.

The ideal is transmission of knowledge leading to immediate corresponding action, but for beginners in particular it may not be discovered until near the end of the course or at the time of the final examination that the knowledge was poorly understood or misinterpreted. To prevent this outcome, particularly in courses that require cumulative knowledge acquisition, it is desirable for the communicator to ascertain the status of the transmission promptly after each class as it becomes a basis for finer-tuned transmission of information in subsequent classes and courses. For the success of subsequent efforts and for the learner to build on imparted knowledge, definite and systematic knowledge mastery is a basic prerequisite.

In any era, the essential factors are how communicators who have gained specialized knowledge and training perform their transmission, reception, and support, and fulfill the responsibility of providing accountability in this process.

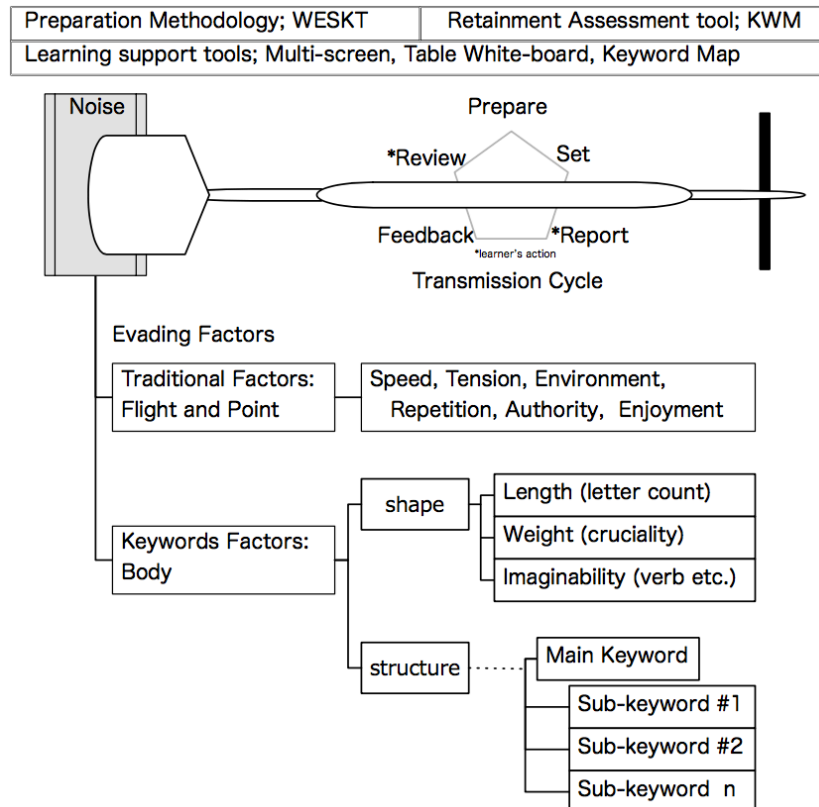


Fig.1 DART Scheme (Detectable Activities for Retainable Transmission)