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ABSTRACT

A series of eight manuals dealing with the triad text characteristics--learning processes--learning outcomes are being prepared for use by authors and editors as an aid in the design and writing of educational texts. These manuals are based upon a model for the functioning of text characteristics which in turn is part of a decision model for the production of educational texts. These two models are described along with the clusters of characteristics covered by the manuals and the manuals themselves. The broadly defined clusters are composed of different text characteristics related to each other on the basis of similarities in either intended function, usage or effect. The eight clusters are: (1) illustrations and symbols, encompassing illustrations (photos, drawings), diagrams, flow charts, tables and graphs: (2) adjunct questions: (3) typographical cueing and accentuation, encompassing underlining, the use of different typographies, headings and subheadings, margins, justification, etc.: (4) organizers, introductions and summaries: (5) text organization and text structure: (6) verstandlichkeit, encompassing the concepts simplicity (sentence construction, word choice), structure, succinctness (compactness) and motivational value: (7) objectives: and (8) auditory supplementation and other aids. (Author/RL)

Manuals for Editors and Authors:

A Decision Model

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Running Head: Manuals for Editors and Authors

Manuals for Editors and Authors

Abstract

A series of eight manuals dealing with the triad text characteristics - learning processes - learning outcomes are being prepared for use by authors and editors as an aid in the design and writing of educational texts. These manuals are based upon a model for the functioning of text characteristics which in turn is part of a decision model for the production of educational texts. These two models are described along with the clusters of characteristics covered by the manuals and the manuals themselves.

Manuals for Editors and Authors

A Decision Model

Ernst Rothkopf wrote in 1970 that you can lead a horse to water, but the only water that gets into his stomach is what he drinks. With this statement he hit the bullseye with respect to a problem which faces all of those who are involved in the field of education. Just as the horse is an active participant in drinking, so is the learner an active participant in learning. For years researchers have concerned themselves with the problem of stimulating the learner to actively engage in his or her own learning. This research has slowly but surely begun to find its way into the "real world" of education in such divergent fields as curriculum development, didactics and in our case, the development of educational texts. At Wolters-Noordhoff this problem of getting the reader actively involved in his or her own learning has led to the preparation of a series of manuals containing guidelines for editors (publishers) and authors of educational textbooks. They are based on the principle that text characteristics are instrumental in influencing those learning processes carried out by readers of that text and that those processes exert in turn a profound effect on learning outcomes. Text characteristics as used here is an umbrella term for those characteristics of a text which are not the primary content of that text (the geography in a geography textbook) but rather characteristics which influence the efficient and effective conveyance of that content.

Preparing such manuals is not a job to be taken lightly. Much of the research done to date has lacked a substantial theoretical basis. Where this basis is present, the divergence of theories, models, paradigms etc. is so great that tying all this up in a neat bundle usable by those not "adept" in psychology is no easy matter. Central to most of this research however, is the premise that the learning activities which the reader engages in, mental or physical, must be considered the central point of departure and that the way in which the information in a textbook is presented can create the conditions for those activities. Finally, most researchers are nowadays cognizant of the fact that within the

learner different learning activities lead to different learning processes and thus in turn to different learning outcomes.

This paper is not meant as a review of the literature in this field, as a state of the art paper, nor as an exposition of all the guidelines present in the manuals. It is intended rather to present a picture of the foundations upon which these guidelines were founded and to illustrate how this can lead to the production of better learning materials.

The text characteristics chosen

The series, when completed, will consist of eight manuals, containing not rules, but guidelines for the use of different text characteristics in textbooks. Each manual deals with a different broadly defined text characteristic cluster. The broadly defined clusters are composed of different text characteristics related to each other on the basis of similarities in either intended function, usage or effect. The eight clusters are:

- Illustrations and symbols, encompassing illustrations (photos, drawings), diagrams, flow charts, tables and graphs
- Adjunct questions
- Typographical cueing and accentuation, encompassing underlining, the use of different typographies, headings and subheadings, margins, justification, etc.
- Organizers, introductions and summaries
- Text organization and text structure
- Verständlichkeit, encompassing the concepts simplicity (sentence construction, word choice), structure, succinctness (compactness) and motivational value
- Objectives
- Auditory supplementation and other aids.

Each of these manuals is accompanied by a checklist containing the most important guidelines for easy access by the users. Every major topic present in the guidelines is also present in the checklist.

A model for the functioning of text characteristics

The first principle lying at the basis of these manuals is that text characteristics work primarily during the perception and processing of information rather than during retrieval. Further, perception (attention to either all or part of the massage) and processing are not seen as being two discrete events, but rather as two points on an information continuum. Each of the previously mentioned text characteristics affects the processing of information at at least one point, but often at more than one point along this continuum. Put simply, before the reader can process and store the information in a book, he or she must first focus on that book and read it. Text characteristics affect this process in the following way. First, certain characteristics may affect the accessibility of that which is to be learned. Second, certain characteristics affect perception of the information either generally (motivational factors) or selectively (attentional factors) depending upon the characteristics. Once this has been accomplished processing and eventually storage follows in one or more of the following activities (N.B. This list does not pretend to be exhaustive):

- the learning of specific facts, concepts or principles (fact retention)
- application of contents to other situations and areas (transfer)
- drawing of inferences on the basis of information present in the text (synthesis)
- identifying and discriminating between superordinate and subordinate information (analysis)

- bringing together separate propositions from the text (integration/concatenation)
- breaking up macro- and meso-level text components into smaller, micro, components (segmentation)
- expanding on the information in the text (elaboration)
- forming relations between that which is already present in one's cognitive structure with new information (assimilation)
- altering one's cognitive representation of things to accept new information (accomadation)
- reviewing of information in the text (rehearsal).

Each of these activities may be affected by any and all of the previously mentioned characteristics.

The second principle is that by looking only at text characteristics and the learning processes which they instigate and where appropriate facilitate, an important part of the learning triad is left out. What has been forgotten is the learning outcome. Simply stated, different text characteristics instigate or stimulate different learning processes which in turn lead to different learning outcomes.

Analogous to Mayer and Greeno (1972) it is presumed that the use of different text characteristics will result in processing behaviors and learning outcomes which are functionally distinguishable. The question which then arises is not "which characteristic is best?", but rather "which process(es) leading to which learning outcome(s) is (are) desired by the author or publisher?" In this way the author is required to specify both what it is that he/she would like the reader to learn and what he/she would like the reader to be able to do with that which has been learned. After specifying both of these outcomes, it is hopefully possible to select means (text characteristics) which will facilitate reaching that end.

Combining the text characteristics as mentioned in the preceding section with the learning processes above, we arrive at the following matrix construction. (See page 5.) The choice of text characteristics and learning processes in this matrix must be determined by the needs and possibilities of each user separately.

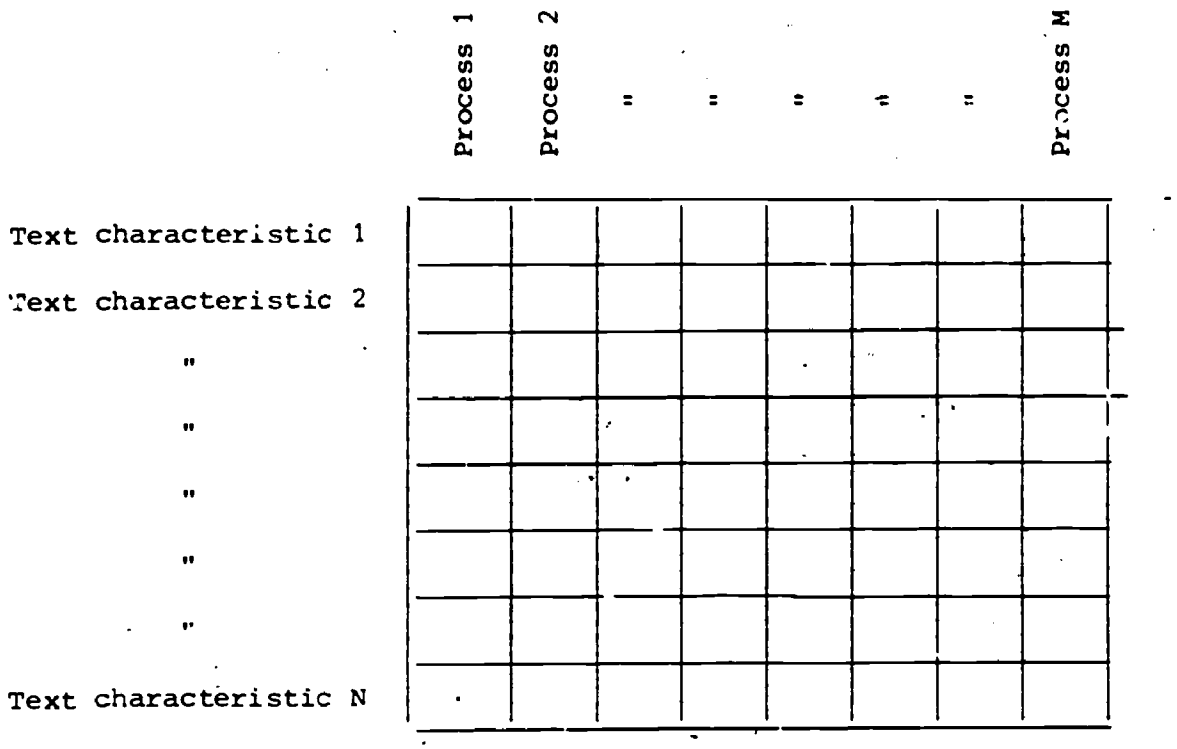

Figure 1. Text characteristic - process matrix.

This matrix however is for our purposes at Wolters-Noordhoff still incomplete in that an important dimension han been omitted; the learner. An educational publisher prepares educational materials for e very broad and heterogeneous market. In doing so, the publisher must define the learner's characteristics in terms relevant to that market. At Wolters-Noordhoff, the learner group is defined in terms of both level and type of education. This leads to the following groupings:

- lower elementary (K through 3rd grade)[1]
- upper elementary (4th through 6th grade)
- first form/junior high school (7th and 8th grade)[2]
- polytechnic or vocational
- second form/senior high school (9th through 12th grade)[3]
- college and university.

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[1] In 1983-84 Holland is planning to make schooling from age 4 compulsory.

[2] This is undifferentiated as to school-type, (i.e. vocational and academic)

[3] This is differentiated into three schooltypes - Mavo (4 year), Havo (5 year) and VWO (6 year).

Two different methods are being used to help arrive at a way of categorizing such large groups of students in terms of processing activities. First, use has been and is being made of the available literature dealing with cognitive development, cognition and individual differences. Second, Wolters-Noordhoff has partially subsidized a project with the University of Amsterdam, in which a series of experiments are being carried out at the first form, second form and university levels, which among other things is providing data which may help to further the "categorization" of the learning strategies employed by these different groups. (N.B. At this point it is necessary to point out that no one is so naive as to venture the premise that all those attending a certain type of school at a certain level process information in the same way. What is possible is that there are hopefully certain useful generalizations within these groups which may be made.) This is being done with the help of the Study Attitudes and Learning Strategies questionnaire, an instrument developed (adapted) by Drs. L. Wouters at the University of Amsterdam. This instrument, composed of a number of subscales is able to discriminate between a number of those aforementioned learning processes.

Adding this dimension to the previous matrix, we arrive at a three dimensional matrix which encompasses the whole of that which is relevant for those who attempt to write or publish educational texts. A fourth dimension might possibly the subject area to be learned. This however comes on the order in the following section. The completed model, as of yet only partially filled in, can be found on the following page.

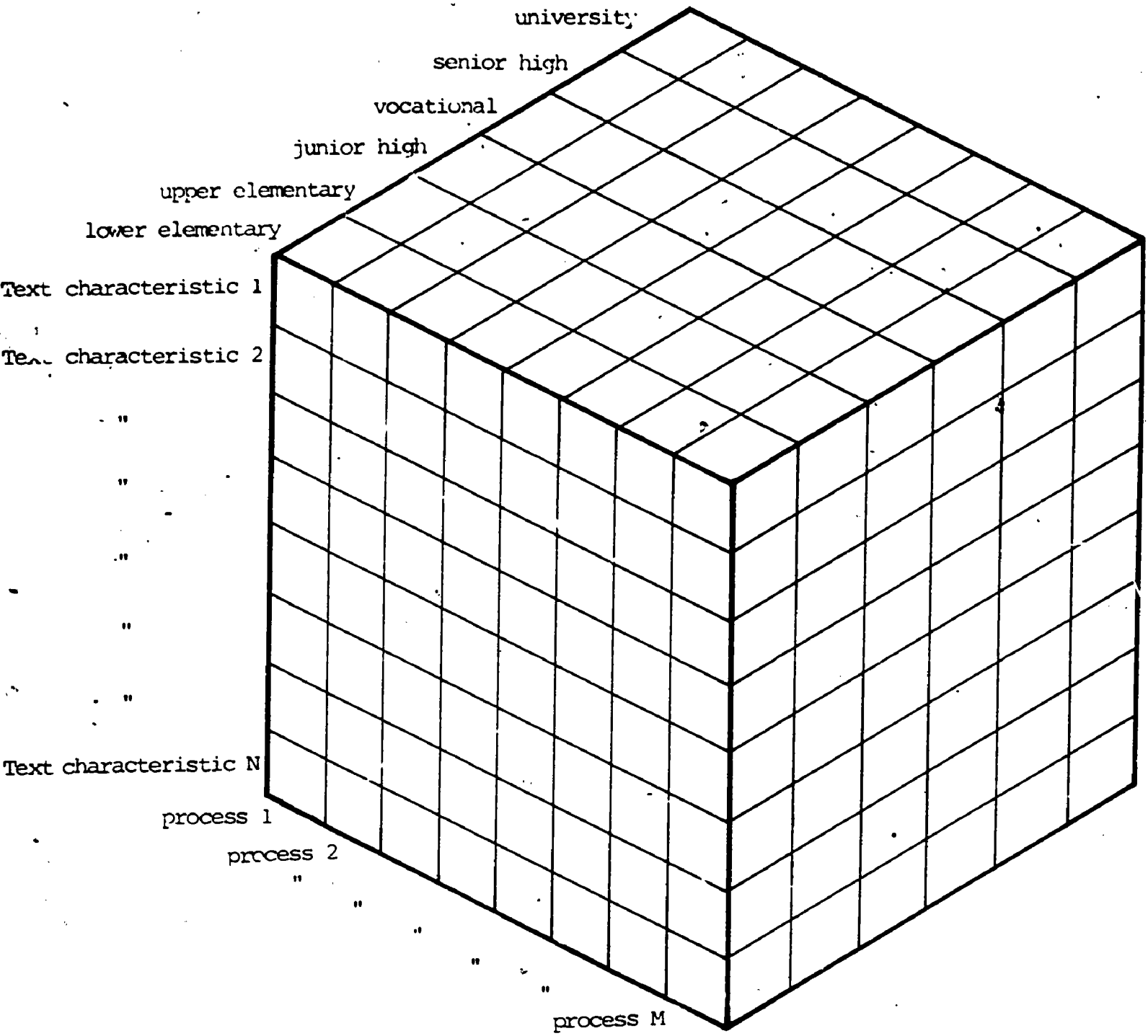
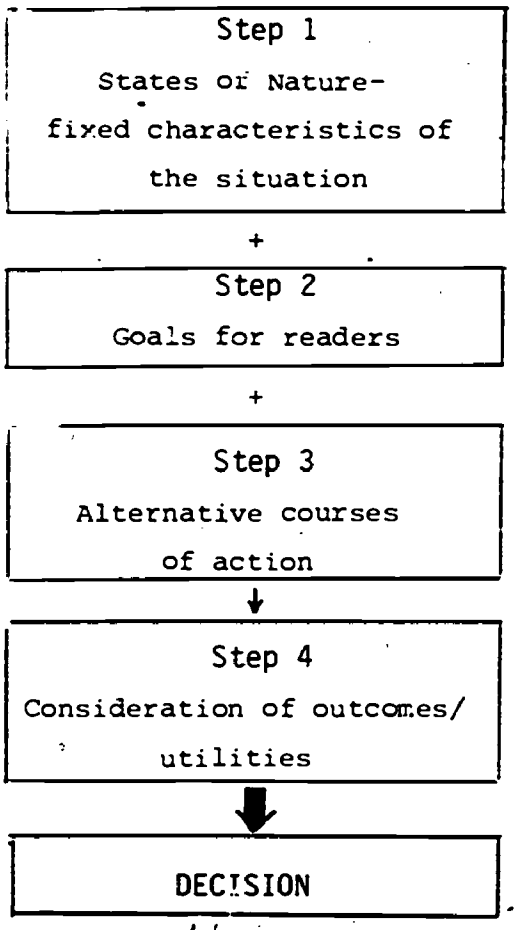


Figure 2 - Text Characteristics x Process x Learner group matrix

Our desire is to be able to fill as many of the cells in this matrix as possible with reliable data in a way which is accessible to those involved in the preparation and publishing of educational texts.

The decision model

The goal is thus the facilitation and encouragement of learning in those who use the textbooks. In striving to attain this goal, the textbook maker must make a series of decisions concerning various aspects of that book. These decisions must be as based upon the publisher's and author's understanding of the learning situations, in which the book will be used, the learning processes attributable to the reader, the expected learning outcomes and the effects of text characteristics on each of these just mentioned facets. The decision model for the selection and use of text characteristics from a set of alternatives in attempting to reach a specified learning outcome is somewhat analogous to Shavelson's model for decisions relating to teaching acts (Shavelson, 1976).



The first feature, states of nature, refers to those characteristics of the bookmaking process which are not, or are barely under the author's or publisher's control. The text which is to be produced is aimed at a certain group of students in a certain subject area. The developmental, cognitive, affective and social states of nature of this target group are not easily influenced. Nor is the nature of the subject matter involved. It may be intrinsically exciting or boring, abstract or concrete, simple or involved, etc. These considerations are relatively fixed.

The second feature, goals for readers, consists of the explicit statement of the desired learning outcomes by either the author or the publisher or both. This is not done in terms of a long list of behavioral objectives, but rather in terms of general goals which one has when producing learning materials. One can imagine here goals as banal as learning the names and dates of noteworthy historical events to goals as for reaching as understanding the interaction between geographical conditions, social situations and historical events. The author and publisher must have a vision of what the desired learning outcomes are before they can begin at all.

The third feature, alternative courses of action, involves the consideration of the choices open to the author or publisher with respect to the text and text characteristics. Alternatives relating to the text might be whether the text should be conceptual, descriptive or argumentative in nature. Other alternatives are, for example, whether the text should be programmed or not; whether there will be illustrations or not; whether the illustrations are meant to be provide complementary information to the text, supplementary information to the text, or to have only motivational value; whether the text will be expository or exemplary in nature; etc. Alternatives relating to the text characteristics are, I think, a self explanatory concept.

Consideration of information in steps 1, 2 and 3 leads to the fourth feature, consideration of outcomes and utilities. Each combination of a text characteristic with a text type, a goal and a state of nature leads to a certain outcome. These outcomes must be compared with each other to arrive at a decision, that being the optimal combination of text type and text characteristics for optimal achievement of the stated goals (learning outcomes). In this consideration, various limiting factors such as budget and time restraints, market variables, whether the method is a revision of an existing method or a completely new method, etc. also may play a role in the decision process.

The Manuals

The Manuals, one for each of the earlier stated text characteristics, consist of at this moment two, but eventually three different components, each with a specific function.

The first component is an unabridged manual containing a wealth of information on the cluster which it deals with. Basically it is composed of three parts. The first part, a theory section, is intended to create a conceptual framework within which the guidelines can be better understood and to guarantee (as much as possible) that the entry knowledge level of all readers is approximately equal. The second part contains general guidelines dealing with the subject of the manual. The third part contains specific guidelines dealing with the finer points of that subject. An example of the contents of the manual dealing with illustrations and symbols is as follows:

1. Theory
2. Illustrations in general
   - 2.1. General guidelines
   - 2.2. Complexity
   - 2.3. Positioning
   - 2.4. Colour/Black and white
3. Diagrams, graphs and tables
   - 3.1. General guidelines
   - 3.2. Flow charts
   - 3.3. Pie charts, circle charts and bar charts
   - 3.4. Graphs
   - 3.5. Tables
4. Limiting factors

Figure 3 - Contents of Manual number 1.

The second component is a greatly abridged version of the manual containing the same topic divisions, but either only the most important guidelines or the most general guidelines relating to each topic. The total number of guidelines in this version ranges from 15 to 21 guidelines and no cluster has, as of yet, yielded an abridged version longer than two pages. While the goal for the unabridged version is in-depth coverage of the text characteristics, the goal of the abridged version is to be an easily accessible and user-friendly document for authors and editors. The abridged version should be seen as a springboard for using the unabridged version and as a valuable aid in Step 3 of the decision model.

The third, but as of yet not completed component, is a checklist for implementing each text characteristic. That is, once a decision has been made, a checklist of the salient aspects pertaining to usage, form, formulation etc. of the text characteristic is provided to assure proper usage.

Conclusion

The reader enters a potential learning situation with certain tendencies and strategies which he or she will use while reading and trying to learn from an educational text. These tendencies and strategies are not fixed, but can presumably be influenced (instigated, altered, facilitated or enhanced) by the characteristics of the text (content as well as non-content related).

The educational publisher's job is to provide the conditions, within the learning material, which will allow those learning processes to be instigated, altered, facilitated or enhanced. Thus the educational publisher must be cognizant of what those learning processes are, how they can be affected, the different desired learning outcomes and the relationships between these three facets of the reading/learning process.

As Ernst Rothkopf wrote in 1976, "For best results, care should be taken not only that students read to learn but also that the text has been written to teach."

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