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Self-Instruction in Formal and Informal Learner Settings: Learning Outcomes and Opportunities

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Abstract

This paper examines some of the key features of self-learning materials and highlights some of the principles that should ideally govern the designing of these materials. The range of materials that have been covered include conventional programmed materials , distance and open education learning materials to e-learning materials .The authors wish to highlight the design principles of materials development in these materials and discuss their relevance and appropriacy to any teaching-learning situation

Key words: Self-learning; Self-access; Learner autonomy; Distance & Open Learning materials

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INTRODUCTION

Instructional materials ranging from the programmed learning texts and the teaching machines of the previous decades to the present day web-based learning materials have been repeatedly reviewed by experts in order to ascertain their effectiveness. It is both relevant and therefore important to examine some of these materials, which serve learners' needs either within a formal curriculum or outside the same. a) do not require the presence of a teacher b) are mostly self-explanatory and c) allow the learners to work at their own pace and time. The materials taken up for discussion include programmed learning materials, web-based learning materials and distance and open learning materials. The aim of this paper is three-fold:

a) to present a brief survey of literature describing different types of self-instructional materials

b) to examine some of the unique features and design principles of these materials

c) to identify some of the features relevant to the materials design of a new kind that can be adapted to any teaching-learning situation.

1. PROGRAMMED LEARNING MATERIALS

Programmed instruction, a very popular method of instruction in the 50's and 60's was based on the behaviourist theories of learning. The principles of programmed instruction, as discussed by Holland, Skinner, and others include: a) Clear learning objectives : clearly spelt out concepts, principles and performance criteria; b) Small steps: content presented in small steps, one segment at a time; c) Logical sequence: logically organized materials with preparatory initial concepts followed by more complex ones; d) Active response from learners (where they are encouraged to construct and not simply recognize the correct response; e) Immediate feedback; f) Drill and practice (through repeated opportunities and plenty of examples; g) Stimulus-fading through a carefully designed sequence of priming, prompting, and fading of cues (qtd. in Fernald and Jordan).

In Programmed Learning Materials, the learning content is sequenced in small steps and provided as a series of frames, through which the learners are led in an order and are encouraged to respond actively along the way. The learners interact with the content in one frame and can move on to the next one only after mastering it. The content is mastered as they gradually progress from one frame to another, all by themselves without much help from a teacher. The main advantage of these materials is that the learners, at a given point of time, are exposed to only a limited amount of learning content and are given immediate reinforcement or feedback, i.e. they get to

know the results of their response. Further these materials facilitate learning and allow learners to set their own pace and schedule. Motivational aspects are taken care of by the immediate feedback that the learners receive. However, the learners proceed in a 'lockstep fashion' and cannot go back to a particular frame, which they are deemed to have mastered.

The difference between Self-access materials and Programmed Learning or 'Teach yourself' kind of courses, according to Sheerin, "depends on the role of the learner and the degree to which he involves himself in the decisions which affect his learning....". She quotes the following words of Dickinson:

> … if self-access is attempted with learners who are not self-directed then either it does not work or the materials need to be designed so that many of the management tasks undertaken by the teacher are built into the materials. Many programmed learning materials are of this kind, and one interpretation of individualised instruction assumes materials in which a teacher is hidden (Self-access 1991 :150).

2. E-LEARNING MATERIALS

E-learning materials, a natural outcome of the advancements in technology, led to refinements in the design and presentation of materials. In one sense, they can be considered to be the advanced versions of teaching machines and programmed learning materials. In addition to promoting autonomous learning, e-learning materials have gained immense popularity due to the rich scope for interactivity and assessment that they offer, largely facilitated by the use of multiple media and hypermedia. This fact has been acknowledged by experts. Perez Fernandez studied the potential of the World Wide Web to expand the possibilities of language teaching, particularly in the field of specific content areas. According to the author, the web offers facilities for "easy" and "instantaneous" access to sources of information and specialized text and data, which were otherwise either unavailable in the past, or took a longer time to access (2001:119). A study by Blake on L2 Spanish inter-language helped him conclude that the alleged benefits ascribed to the Interaction Hypobook could be provided by computer-mediated communication. Importantly, Blake felt that some of the conditions of Second Language Acquisition such as negotiating meaning were successfully met by the facilities offered by the CMC (2000:120). Dafne Gonzalez and Rubena St. Louis describe how web tools promote autonomous learning by creating opportunities for learners to exercise responsibility (2008:30).

Carol Chappelle discusses cognitive principles of Second Language Acquisition like input salience, input elaboration and input modification etc in the light of Computer Assisted Language Learning (CALL) materials. Web-based learning materials, with rich input from media and the options in hypertext, offer various facilities for elaborating, modifying or highlighting input. This is done by way of providing simplified expressions, using images, giving L1 translations, providing glosses, highlighting structures and so on (2003, pp.44-60). Thus in terms of accessibility, interaction, content and skill development, e-learning materials have a special advantage and have won wide acclaim by virtue of the same. Tony Bates discusses some of the core educational characteristics of online learning. The web enables a certain degree of presentational enhancements with the help of graphics, animation and the audio visual media. The opportunities provided by these web-based materials for different kinds of structuring the material are also discussed (2005, p.141). In addition to this, Bates also recognises the inherent potential of these materials to facilitate a wide range of academic skills and other critical thinking skills, such as knowledge construction, critical thinking and so on (p.142). Web also enables different kinds of interaction with materials, teachers and peers as well.

In summary, Bates mentions that web-based materials seem to have certain advantages over print-based materials in terms of content, presentation, structure and skills development (p.147).

Rebecca Fanany sheds light on the various opportunities offered by technology for enhancing autonomous learning and encouraging student responsibility. The online medium supported by technology not only allows for sound, movement and interactivity, but also provides scope for incorporating genuine materials like film clips or video recordings (2005, p.36). Quoting Kearsley, Fanany mentions that "student centeredness" has been identified as the prime theme in on-line learning, which is less structured and depends more on autonomous learning. The "non-linear mode of presentation", where the learners are offered a personalized menu-like structure, allows them to choose from a range of materials and activities. In addition, she also discusses the potential offered by these materials to place large sections of text that can be uploaded quickly and made available for student use (p.41). For assessment purposes, the web offers plenty of interactive exercises (p.44).

Multimedia materials support different forms of content organization when compared to conventional materials. Ron Oliver, Jan Harrington and Arshad Omari analyse some of the critical considerations while designing electronic instructional materials. In this context, they refer to the potential offered by hypermedia "to create materials with varying degrees of linearity....". Also, the "linear" and the "referential linking" options form a continuum in such an environment, offering learning both structure and freedom to develop their initial and higher levels of knowledge respectively (1996, p.2). At this juncture, they reiterate the need for aiding orientation within the learning materials by adopting suitable strategies and also emphasise the need for presenting coherent texts

(p.3). In terms of interactivity, in a web-based learning environment, the "…Intelligence of technology is used in place of the instructor and the exchanges are made between the learner and the programmed instructional system and feedback is provided…." (p.5).

Yet another work of Ron Oliver outlines some of the very important features of these materials. According to him, multimedia materials support many different forms of content organization when compared to conventional materials. In terms of content, multimedia materials support different forms of media that are used in combined instructional settings to be presented (2007, p.1). In terms of organisation, they support "multiple organizational modes" that extend beyond the "sequential modes", which are typically the constraints of conventional forms (p.2). With respect to interface, they support a range of interface designs and approaches (pp.2-3).

Bates discusses the learning support offered by learning objects in web-based learning materials. Integration of learning objects like a single graphic, a simulated laboratory experiment or a short module of teaching can provide a great deal of support for the learners (2005, p.142). Richard Hall et al. explain certain important principles such as "directionality, usability, consistency, multi-modality, interactivity, adaptability and progressive complexity", while laying guidelines for designing web-based materials (2003, pp.3-11). They emphasize the necessity for identifying and taking into account learners' contexts and goals and achieving a delicate balance between the principles of "simplicity and complexity". While the new designers tend to include "superfluous" that do not contribute to learning goals, the seasoned designers, on the other hand, concentrate on "…elements of simplicity, usability and consistency, sacrificing dynamic and interactive components that would potentially enhance learning within the context of the objectives…." (p.3). The authors also discuss the suitability of hypertext for increased activity. While the learners proceed through pages of the hypertext in a non-linear fashion, they do involve themselves in a greater level of activity when compared to their involvement in linear reading they adopt while reading a traditional text (p.9). Richard et al. also highlight the facilities offered by this medium for presenting the learning content in multiple modalities (p.9). Since they allow for multiple modes of representation, visual or verbal, in terms of adaptability, learners are allowed to select the preferred format that suits their preferred mode of learning. Hypertext, an important aspect of web, contains immense potential for "…representing complex knowledge via multiple associative links..." (qtd. in Richard et al.7).

Kuiper, Volman and Terwel delineate some of the specific characteristics of web and their implications for the organization of education. Hypertext, which primarily enables "interlinking between "texts, opinions and ideas" (p.304), offers possibilities for learners to choose their own path of learning by following certain links which would direct them to obtain information. While acknowledging web as an information resource and its wide accessibility to information, they also remind us of some of the limitations of this medium. Given the volume of information, the learners must be supported with information literacy skills, critical thinking skills and searching skills, required reading strategies and so on. Such an attempt would give the learners a sense of direction and purpose, thus preventing them from distractions while wading through the sea of information (pp.308-309).

3. DISTANCE AND OPEN LEARNING MATERIALS

As far as the distance learning materials and open learning materials are concerned, literature abounds in discussions regarding the features and design principles of these materials. Aimed at facilitating the process of learning at a distance in the absence of a teacher, these materials are carefully designed with adequate support systems and unique stylistic features.

Derek Rowntree observes that in distance learning, open learning or self-learning situations, the learners are "heavily dependent on teaching materials." These materials are expected to execute certain functions like "...guiding, motivating, intriguing, expounding, explaining, provoking, reminding, asking questions, discussing alternative answers, appraising the progress, giving appropriate remedial or enrichment help and so on...." (1990, p.11), which, in a traditional set up would belong to the teacher or the trainer. Hence, it is only desirable that these materials are designed with great care and are also based on sound educational principles to effectively substitute the teacher. Borje Holmberg, Fred Lockwood and Derek Rowntree have offered several suggestions related to the design of open and distance learning materials. The design guidelines offered by them are briefly reviewed in the following paragraphs. These suggestions and discussions cover a wide range - right from the appearance and typographical considerations to the nature and type of activities to be included, the access devices to be incorporated, the simplifications to be carried out and so on.

Holmberg describes the nature of distance educational materials as "guided didactic conversation", which entails the following for course developers and materials designers:

- Easily readable style
- Clear and colloquial manner of presentation, with moderate density of information
- Personal style and use of personal pronouns 'I', 'you' and 'we'
- Structuring of contents, both verbally and typographically
- activities stimulating questions, discussions and reactions from the learners 1985: (27).

Rowntree, who refers to self-instructional materials as "tutorials in print", feels that these materials must represent teaching directions as well as subject content (1990, p.82). Richard Marsden recommends the use of a clear, easily readable and colloquial style in these texts (p.226). In Geertz's opinion, texts are a means to stimulate interest and to guide and train learners' imagination (qtd. in Marsden, p.237). Chia clearly lists the functions, content, pedagogical strategies and evaluation procedures of an 'eclectic' curriculum (qtd. in Shankar,1997, p.93).

Open learning materials need to compensate for the absence of teacher both in terms of presentation and stylistic enhancements. Some of the special features of open learning materials, as pointed out by Derek Rowntree are

- Clearly stated objectives
- Advice about how to study the material
- User-friendly, "you and I" type of writing
- Shortish, manageable chunks of learning
- Fewer words than usual per page (on screen)
- Plenty of helpful examples
- Reference to the learners' experience
- Illustrations chosen where they are better than words
- Headings to help learners find their way around
- Links to other media where appropriate
- Obvious awareness of differences in learners' needs
- Exercise that get the learners to use the material
- Space for learners to write down their own ideas
- Feedback to help learners check their own progress.
- Suggestions about getting help from other people

(1994, p.13)

Yet another way of facilitating learning is by using access devices. In Rowntree's opinion, these access devices guide the learners through the structure of the material to find what they need, thus making the structure more apparent to the learner and helping them to learn. He recommends the following three groups of access devices to be used in the materials. The access devices to be used before the lesson are a) explanatory title b) content list c) concept map / flow diagram d) list of objectives e) pre-test ; those to be used during the lesson are a) introduction / overview b) links with other lessons c) headings d) numbering systems e) instructions f) summaries. The devices to be used at the end of the lesson are a) glossary b) post-test and c) index (Teaching Through, 1990, p.163).

In order to ensure learner involvement, these materials need to stimulate learners' interest by way of plenty of activities. According to Rowntree "… activities, questions, tasks, exercises … are vital features of self instructional materials" and are meant to keep learners "purposefully engaged with the material" (qtd. in Lockwood,1992, p.26). Fred Lockwood discusses three important concepts which would guide the design of activities in self-instructional texts. They are a) tutorial-in-print (Rowntree) which "simulate a dialogue between the tutor and the learner" (p.26) b) reflective-action guide which depends on reflective-action based activities and c) dialogue (Evans and Drayl Nation) which refers to "communication" the instructional materials generate and the "reflective activities", which in their belief should "permeate the whole material...." (1992, p.41).

Derek Rowntree advocates promoting active learning. The author also discusses some ways of teaching concepts and principles which include a) analyzing the main ideas b) telling learners what they might learn to do c) ensuring that learners are given all the prerequisites d) giving examples, border-line examples and non-examples of new ideas e) progressing from simple to complex, concrete to abstract f) linking new ideas to learners' experience (g) getting learners to apply the ideas h) giving learners feedback or their activity and also practise with the ideas (1996, pp.138-148).

Marland and Store analyse learners' use of texts and some of the devices used to orient the learner and to introduce the material in the distance-learning context. The devices include advance organizers, overviews, pre-tests and objectives. The practice of inserting questions (which is likely to trigger the 'mathemagenic behaviour (Rothpokf) and the presentation of texts and graphics are also discussed. The article also gives some practical suggestions for course design (pp.75-106). The nature of the study materials used in distance education is critically studied by Koul, with a special focus on the difficulties encountered by learners with English as their second language. Koul observes that the most widely used method of solving those problems is 'simplification' of study materials. However, the usual methods of simplification like using familiar words, shorter sentences, illustrations, and glossaries cannot serve the purpose beyond a point. Oversimplification may lead to depriving the very language characteristics specific to that discipline. Koul criticizes the discipline-driven or writer-structured orientation of the study materials and stresses the need for transfer of knowledge and experience (discovery learning and spiral curriculum), instead of mere transfer of knowledge. The study materials, in some cases, appear like academic articles/essays merely involving information and the writer's point of view (qtd. in Shankar, 1987, pp.99-100).

Self-learning materials have the following characteristics: a) self-explanatory b) self-contained c) self-directed d) self-motivated e) self-evaluating and f) self-learning (2007, pp.15-16). While discussing the task of developing activities, Rowntree points out that learner activity can be prompted by (i) embedding questions or exercises in the material (ii) placing sets of questions at the end of the lesson (iii) giving assignments or exercises (13). He also discusses the need for using access devices in text and the importance of being reader-friendly (1994: 101). A typical course module of the Indira Gandhi National Open

University (IGNOU), India, comprises four or five blocks and each block is made up of constituent units. Each unit presents the objectives, followed by an introduction. The content is presented under appropriate chapter headings. The unit concludes with a "Let's sum up" part. The activities are incorporated within the text. Every unit ends with possible answers for "Check your progress" unit. The language used is simple and the style is conversational.

A module published by the IGNOU discusses the issue of simplicity and advocates the following steps for simplifying distance-learning materials: a) keeping sentences short b) writing simple sentences c) avoiding high sounding words d) paragraphing ideas properly and e) using a conversational and friendly tone etc. The need for evaluating the readability of the material has also been recommended (2001, pp.36-38).

Som Naidu's article discusses the theoretical framework for applying learning and instructional strategies for an on-line environment. She discusses the content presentation strategies (advance and graphic organizers, objectives, instructional illustrations), activation strategies (student participation, reading and study skills training, in-text questioning and upgraded homework), social support strategies, and feedback and correction strategies (1994, pp.29-30). A study conducted by Valcke et al. on the use of ESD (Embedded Support Devices) in self-study materials by distance learners revealed that learners make use of these devices to assist their learning. The study proved that these devices such as advance organizers, objectives, questions etc were worth their effort (1993, p.55).

In distance learning materials, the required amount of learner-direction is given by way of proper structuring and the use of in-text questions and other access devices. Provision for feedback is offered by answers to "Check your progress" questions. Inbuilt glossaries and reference sections can help learners support their learning and seek additional sources of information. However, these materials have a disadvantage in terms of space and accessibility, when compared to e-learning materials.

The discussions related to various self-instructional materials provide an understanding of the functionality of learner-direction, facilitated by means of various methods and devices.The features of these materials that stand out are :

• presenting learning content in small units in a logical form

• connecting what the learners already know to the new items to be learnt

• providing simplifications and support materials like advance organizers, glossary, analogies, pictures and other devices

• getting learners to actively become involved with the help of interesting activities

• making provisions for feedback

• using a simple and conversational style of writing.

CONCLUSION

While it is true that these materials also attempt simplification of learning matter through various devices like in-text devices and illustrations, effective assimilation cannot happen unless the concept of simplification is viewed from different perspectives. Pedagogical innovations have to be incorporated at the preliminary stage of materials design itself, before considering ways of structuring the materials. An analysis of these materials raises questions about the extent to which these materials facilitate autonomous learning. The following observation by Holec might be an answer to this question:

> On close examination, it is seen that that these types of teaching do no more, under the most favourable circumstances, than enable the learner to take charge of the practical organization (rhythm, time and place) whereas the aim, content, methods and evaluation of that learning are invariably decided from outside, leaving the learner no opportunity to intervene. His responsibility is thus severely restricted and the degree of self-directed learning scarcely justifies the mention of autonomy in such an instance. (1981, p.4)

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