A Fundamental Research and Development of IT Education with Special Emphasis on Spiral-Approach

Fumihiko SHINOHARA

Tokyo Gakugei University, Tokyo JAPAN

1. Introduction

The curriculum includes the whole experience which a child undergoes during schooling, and covers the educational aims and goals, courses, classroom activities, staff-student relationships, resources and many other factors which impinge on the teaching-learning situation in schools. Then the area covered by the curriculum during basic education or compulsory schooling has grown wider and more sophisticated.

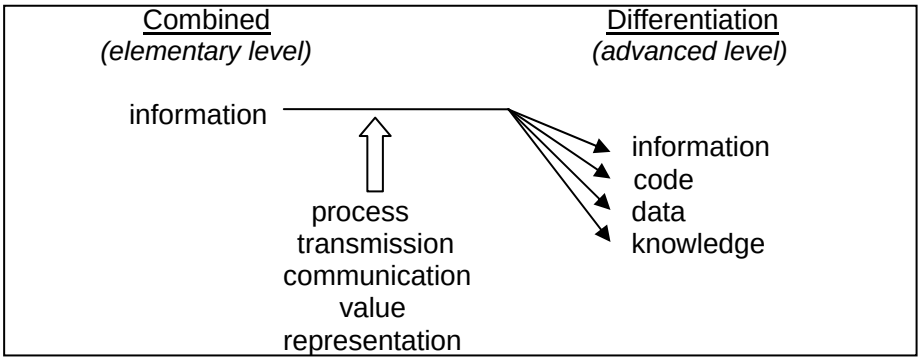
2. Education Now and the Future

Teachers will have to refrain from simply transferring subject matter through recitation to their students. Students who will be provided with varied learning experiences that serve their needs. Teachers will learn on an interactive basis with their students in real situations. They will fully appreciate the potential of individual students, who will be encouraged to develop to the highest level possible. Students in each class will have a variety of teachers i.e. parents, brothers and sisters in their families, neighbors, community leaders, local wisemen, artists, holders of different occupations in the local or regional communities. In this regard, the shift from cognitive learning to all-round intellectual and social environment requires schools to assume a wider responsibility for the learning experiences of their pupils.

3. Spiral Approach and An Exemplar Application to IT Education

The idea of the spiral approach stems from the intellectual way of organizing content topics in a curriculum 'Spiral Curriculum' proposed by Brunner, J. S., where content topics should be systematically reintroduced at periodic intervals such as every academic year considering the developmental stages of learners. Two purposes are served by such a scheme; (1) the previously learned knowledge of the topic is given a review, which tends to improve its retention, and (2) the topic may be progressively elaborated when it is reintroduced, leading to broadened understanding and transfer learning. The content topics should be carefully selected in the discipline, which is also used in our daily life as different concepts and meanings combined or as pre-conceptions.

The figure below shows the progressive differentiation of 'Information,' which may lead us to informatics or information sciences and information engineering, while computer networking, database, modeling, control, and recognition are also key concepts to be clarified in due course.



4. Conclusion and Recommendations

The conception of the spiral curriculum has not as yet been explicated in detail in IT education, but it appears to hold much promise for future curriculum design efforts.

In this connection, with bearing mind of the progress of software technology, key and basic concepts in the area of IT education should be examined in the student's learning process.

References:

Bruner, Jerome S., 1960, The Process of Education, Harvard University Press, N.Y.