Discovery Learning Theory
A Primer for Discussion

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Why this question?

Information technology's evolution:
- Electronic Performance Support Systems (EPSS)
- Knowledge Management Systems (KMS)
- Intelligent Software / Artificial Intelligence (AI)
- Hyperlinking Technologies

Tying these systems to my work in:
- Legal Decision Making (attorneys, judges, juries)
- Executive Decision Making (senior management teams, boards of directors)
- Political Body Decision Making (parliaments, legislatures, assemblies)
- Educational & Classroom Learning Support Systems

Some Definitions

- Discovery Learning is a learning method that encourages students to ask questions and formulate their own tentative answers, and to deduce general principles from practical examples or experiences.

- Discovery Learning is a learning situation in which the principal content of what is to be learned is not given but must be independently discovered by the student.

- Discovery learning can be defined simply as a learning situation in which the principal content of what is to be learned is not given, but must be independently discovered by the learner, making the student an active participant in his learning.

Target "Goals" of Discovery Learning Theory

The ... discovery learning mode requires that the student participates in making many of the decisions about what, how, and when something is to be learned and even plays a major role in making such decisions. Instead of being 'told' the content by the teacher, it is expected that the student will have to explore examples and from them 'discover' the principles or concepts, which are to be learned. Many contend that the discovery learning versus expository debate continues a timeless debate as to how much a teacher should help a student and how much the student should help himself." (Snelbecker, 1974, p. 425)

Jerome Bruner lays out two targets for discovery learning theory:

1. Discovery Learning Theory should act as a refined extension of the broad based theory constructivism by focusing on the individual.

2. Discovery Learning Theory should serve as a way of defining and providing structure to the way in which individuals learn thus acting as a guide for educational research.

Discovery Learning Theory

There are four components to the Discovery Learning Theory:
1. Curiosity and uncertainty
2. Structure of knowledge
3. Sequencing
4. Motivation

There are three principles associated with Discovery Learning Theory:
1. Instruction must be concerned with the experiences and contexts that make the student willing and able to learn (readiness).
2. Instruction must be structured so that it can be easily grasped by the student (spiral organization).
3. Instruction should be designed to facilitate extrapolation and or fill in the gaps (going beyond the information given).

Bruner identified six indicators or benchmarks that revealed cognitive growth or development:
1. Responding to situations in varied ways, rather than always in the same way.
2. Internalizing events into a 'storage system' that corresponds to the environment.
3. Increased capacity for language.
4. Systematic interaction with a tutor (parent, teacher, or other role model).
5. Language as an instrument for ordering the environment.
6. Increasing capacity to deal with multiple demands.

A Background of Discovery Learning Theory

Jerome S. Bruner is credited with first introducing discovery learning as a formal learning theory in 1960.

Bruner publishes The Process of Education in 1960, which introduces the concept of discovery learning.

In 1966, Toward A Theory of Instruction is published, which formalizes his earlier work and expands the four components of discovery learning.

In 1972, Muska Mosston, introduces the concept of Guided Discovery Learning Theory, which becomes a branch of discovery learning theory used in tactile learning environments and situations.

In 1986, problem solving becomes a second classification of discovery learning theory and Bruner includes this in his text Active Minds, Possible Worlds.

In his more recent works, Bruner (1986, 1990) has expanded his theoretical framework to encompass the social and cultural aspects of learning.

Potential Advantages & Disadvantages

Potential Advantages:
- Supports active engagement of the student in the learning process
- Fosters curiosity
- Enables the development of lifelong learning skills
- Personalizes the learning experience
- Provides high motivation because students have the opportunity to experiment
- Builds on the student's prior knowledge and understanding

Potential Disadvantages:
- Confuses the student if no initial framework is available
- Inefficient and time consuming
- Leads to student frustration

References

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