Structural Learning Theory

General

Structural learning theory is one of the cognitivist perspectives on instructional design proposed by Joseph Scandura in 1970s. Scandura's theory suggests human **knowledge is** consisted of **rules** which are to be learned. Those rules are determined by parameters of **domain**, **procedure**, and **range**.

What is structural learning theory?

Structural learning theory suggests that structures (problems) that a learner must learn, need to be formed as rules. Those rules can be simplified into elemental rules (*atomic components*) which represent most basic concepts learner needs to know when dealing with a problem from given domain. By combining these atomic more complicated and finally *higher-order* rules which can be used to solve complex problems in the whole domain.

The starting point of structural learning theory is that rules, which represent knowledge, have three parameters:

- **domain** - its allowed **inputs**,
- **range** - its expected outputs, and
- **procedure** - the sequence of **operations** to perform **on the inputs**.

New rules are learned through application off higher to lower order rules.

In accordance with structural learning theory, first step in instructional design or learning is **definition of the problem domain through structural analysis**. Problem domain can be both well- and ill-defined (when rules are quite simple, yet there is no direct complete solution like chess, or poetry writing). In case of an ill-defined domain, it should be divided into well-defined sub-domains which generate at least one rule. Domain sets the inputs and desired outputs for problem solving.

Domain definition is followed by **construction of hierarchy of rules** for well-defined domains. Rules should be explained on prototype problems, but can also leave some **gaps** in problem solving procedure, which **are then converted into higher-order problems** containing gap rules. Higher-order rules are then used to fill the gap, but can also validate lower level rules.

An important part of the theory is also **prior knowledge (rules)** of the learner, that will **enable construction of new rules**. This knowledge can be examined by instructor, that can be both human or artificial.

Structural learning theory's applications have been made in **mathematics** and **language learning**.

What is the practical meaning of structural learning theory?

Criticisms

Keywords and most important names

Bibliography

Structural Learning Theory.

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Read more

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