LOYOLA Y BLANCO, José, *A DIGITAL PEDAGOGY MODEL*

Abstract: For a Virtual Learning Environment a Digital Pedagogy is required, otherwise learning will be the same as usual with the only difference being, that reading and writing will be on the computer, and therefore the opportunity to use the Computer Science and Technology to empower the student's learning is lost.

The Digital Pedagogy needs to be Multi-Referential, which means that different knowledge areas have to converge to produce the innovative vision for a powered e-learning.

In the Digital Pedagogy Model (DPM) this multi-referential level is defined as Ontology and in this level Areas such as Philosophy, Sociology, Psychology, is integrated with Artificial Intelligence, Neural Artificial Networks, Automata Theory, Modelling Visual Languages and Software Engineering.

These converged areas define, on a second level, a Digital Pedagogy with a Constructivist approach and a Scientific Methodology, in an Integrated Capability Maturity Model for a Digital Pedagogy that evolves in a Continual Improvement Process

This improved Digital Pedagogy is applied to a knowledge area to be taught in order to define a Digital Curriculum which is defined using a Unified Modelling Language (UML) for an Object Oriented Curriculum with two main learning purposes: to learn the computer and the area thinking, i.e., if the knowledge area is Mathematics, it would be Computer and Mathematical thinking.

Finally the Digital Curriculum defines a Didactic Planning focused on building digital resources for Activities of Cognitive Interactivity with the Technological Resources. The activities follow an IDEF0 structure, with: Control, Content, Product and Method components.

The Modelling of a Virtual Learning Environment can be accomplished through the modelling of states of a Touring Machine, where learning takes place through the transition of states in which knowledge products are built.

In one state, a Touring Machine reads and as a result of this action may or may not write, and may or may not make a state transition.

In the learning process modelled by states of a Touring Machine, the student reads, processes the information, builds a product of knowledge through actions and finally changes his state or remains in the same one.

The knowledge products, the operations performed in the actions, and the type of contents read are determined by the abilities of the Structure of Intellect Model (SOI) ensuring in this manner that learning takes place.

The modelling of states is the key to displaying and summarizing the curriculum designed by an UML object-oriented modelling, where a Use Case represents a unit of cognitive resources that is developed by the student.

Each use case is developed through an UML state diagram, and then is validated by a Touring Machine modelling state.

It is expected that, in a virtual learning environment, a student should be able to open his own threads of learning with different contents, conduct state transitions determined by his own learning process and produce his knowledge products, which becomes a case of non-deterministic automata, showing the benefits of adopting the modelling of states of a Touring Machine as a learning model.

Keywords: Digital Pedagogy, Structure of Intellect Model, Knowledge States, Abstract Levels, Cognitive Interactivity, UML, IDEF0.

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