

DIGITAL PEDAGOGY IN MATH LEARNING

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Digital pedagogy is a learning paradigm that can enhance creativity in math learning. In a modern approach toward math learning, learners should be active partners to discover and develop their own knowledge. In this sense Piaget's constructivist principles are the foundation for developing the digital pedagogy in math learning.

In the Piagetian sense children are builders of their own intellectual structures in an enriched environment. We intend to present such an enriched environment in cyberspace in the means of applications and projects that can bring access and collaboration widely. Smart computational devices have the potential to reflect Piaget's dream as "learning without teaching" through the digital pedagogy. Before such a digital paradigm, there were only very poor environment to be able to admire means of Piaget, digital pedagogy offers Piagetian learning path.

The best way that "learning by doing" could be realized is through the "gamification" of math concepts. It can develop a personalized and collaborative learning environment in an attractive and intuitive way that can motivate learners. The idea is to provide a method of learning math implicitly while doing something pleasurable. "Smart Games" create an interactive learning environment where the learning materials are built into the platform and learners can become active and constructing architect of their own learning.

We are focused on "computational thinking" as the relevant process in the digital pedagogic platform. Computational thinking is an algorithmic problem solving approach, which uses some strategies that are special cases of Polya's problem solving in the form of decomposition, pattern recognition, abstraction and algorithm design. We have enriched the four steps of computational thinking by a "playground" as a platform for "learning by doing" and turn complex problems into concrete processes.

We will present an interactive learning platform in digital pedagogy called "Polyup", inspired by George Polya. It is a fun gamified and project-based platform focused on problem solving and algorithm design through computational thinking. Polyup aims to enhance creativity in the learning process and let learners develop their own knowledge. It also serves as a comprehensive playground to address real-life problems on a related project platform. We will present some examples and building blocks of Polyup in the form of gamified concepts and projects. The gained knowledge and skills of this cognitive learning empowers learners for everyday activities as data analysis, reasoning and problem solving. Polyup, in its essence, serves to develop the utopia of the digital pedagogy.

References

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