

## Chapter 7

# Evaluation of the Potential of Ideation Tools to Create Technologies Aimed at Education

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### ABSTRACT

*This project aims to evaluate the potential of an ideation framework, which is based on the idea of collective intelligence, to develop technologies for the area of education, and to be more compatible with the current model of society, having more student adherence. The framework analyzed four tools, which are the empathy map, the user journey, method 6-3-5, and the Edward de Bono hat method was to use as a validation tool for ideas. At the end of the application, it resulted in the choice of four insights to be applied in the system, that is, the amount of system functionalities expanded by 50%, which are a virtual assistant by voice command, a video gallery and podcast, gamification for the user to be reciprocated, and individual study planning to particularize each case, and thus fostering the effectiveness in increasing learning as proposed by the project. However, after the ideas were validated using the hat method, only three of them remained. Finally, this framework has both a versatile, low-cost character and a relatively low application time.*

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## **INTRODUCTION**

According to the Universal Declaration of Human Rights, approved on December 10, 1948, through the United Nations General Assembly Resolution No. 217, access to education in its entirety is a right of all citizens because it is important for the consolidation of democracy and allows individuals to have effective participation in society's decisions. Besides, the Brazilian Federal Constitution of 1988 indicates, in its article 205, that education is a right of all Brazilians and an obligation of the family and the government. Although according to the most recent (2018) International Student Assessment Program (PISA), carried out by the Organization for Economic Cooperation and Development (OECD), Brazil occupies the 66th position in the performance of students in science, 57th place in reading and interpreting texts, the situation of the scenario becomes more alarming when evaluating students' performance in mathematics as the position drops to 70th. When compared to the countries of Latin America, students' performance in science, reading, and mathematics is, respectively, 6th, 5th and 7th positions.

This performance is the result of the stagnant education model, which still tests students four times a year, and uses a tool created by T'sai Lun in 105 AD, better known as paper (Hayasaka & Nishida, 2020), although globalization has several tools that assist in the active learning process such as the personal computer. In addition, this scenario is the result of the evaluation of education professionals. The Ministry of Education (MEC) stated in 2019 that teachers receive around two and a half minimum wages for a 40-hour workweek. In addition, according to the analysis of the OECD report (2018), Brazilian teachers receive the worst salaries among those of 48 countries surveyed.

That is why there are many projects that aim to increase Brazilian educational quality, such as the Support Program for Teaching Systems for Attending Youth and Adult Education (EJA), a youth and adult education program integrated with professional education, among others. However, OECD points out that Brazil maintains a tendency of stagnation when analyzing the results of seven editions of Pisa in reading, six in mathematics, and five in science. Therefore, this project aims to evaluate the potential of the ideation framework, which is strongly based on the idea of collective intelligence, to develop technologies for the area of education, and, in addition to this, being a tool compatible with the current model of society, with this, having more student adherence, making it easier and reducing the workload of teachers. Moreover, it is configured to generate active learning which leads to the creation of long-term memories, that is, to the increase in the level of knowledge of students. Therefore, it is an effective substitute for a visibly stagnant model. In addition to this, this research takes into account that ideation uses tools that show more effectiveness to create projects, such as the empathy map, the user journey, method 6-3-5, and as a validation tool for ideas the Edward de Bono hat method was used in order to generate solid results in a shorter process time, that is, lasting hours instead of days, as well as using less human capital in order to analyze the ability of dynamics to devise systems with more targeted features to solve the problem. Also, based on active learning, to create more sustainable and scalable solutions. So, this project explains how to apply an interactive framework and its fundamentals to generate solutions. This chapter is structured around a theoretical review of active learning and tactics for designing learning. Then, the modeling of an ideation framework and its application.

## **Literature Review**

Within the investigation of the strategic potential of the Ideation framework's application in the qualification of teaching-learning processes, the basis of collective intelligence was studied, as well as raising

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