

# Analysis to Creation: Using the ADDIE Model to Develop an Educational Game for Children

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**Abstract:** Creating educational games for children is a notable emphasis, especially when using the ADDIE model as a game development framework. Furthermore, we introduce the ADDIE model, a recognized instructional design framework, to illustrate its potential in the video game industry. In this study, by using constructivist and social learning theories, educational play can be fostered through exploration, cooperation, and reflection. Hence, we create a children's educational video game using the ADDIE model to explore creating suitable educational games. Striking the right balance between education and entertainment necessitates a comprehensive grasp of how children learn and develop. By leveraging this knowledge, developers and educators can create video games that are both enjoyable and promote learning and development in children.

**Keywords:** ADDIE model, children's educational game, game design

## 1. Introduction

In response to the growing recognition of digital games for early childhood learning, we developed an educational video game for children under 7, focusing on reading, numeracy, social, and emotional skills. Our study is utilizing the ADDIE paradigm, a systematic instructional design framework, we detail our game's creation in this framework.

## 2. Related Video Game Analysis

Hull (2010) found that video games can benefit children with emotional disorders. Parents should supervise game usage, ensuring age-appropriate choices (Gözüm & Kandır, 2021). Video games encourage active learning in the problem-solving (Dhiman, 2023). And innovative thinking. Cooperative play and player instruction promote skill acquisition through (Egenfeldt-Nielsen et al., 2019). Yet, overly complex multimedia can hinder the learning (Chang et al., 2017).

## 3. Applying the ADDIE Model for Effective Game Development

### 3.1 ADDIE Model

Game designers employ ADDIE to create well-structured, engaging games aligned with objectives for the intended audience (Davis, 2013; Muruganantham, 2015). As shown in Figure 1, the ADDIE paradigm offers a structured, collaborative approach to game

development, facilitating clear goal setting, comprehensive planning, and accurate progress evaluation.

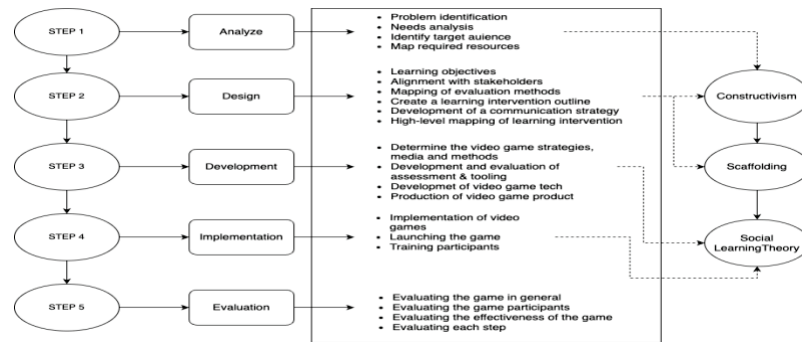


Figure 1. The ADDIE Paradigm

### 3.2 ADDIE Model in Game Design Process

The ADDIE model ensures purposeful game development that meets audience needs, as seen in Braad et al. (2016) study It offers designers to create effective and engaging games as illustrated in Figure 2.

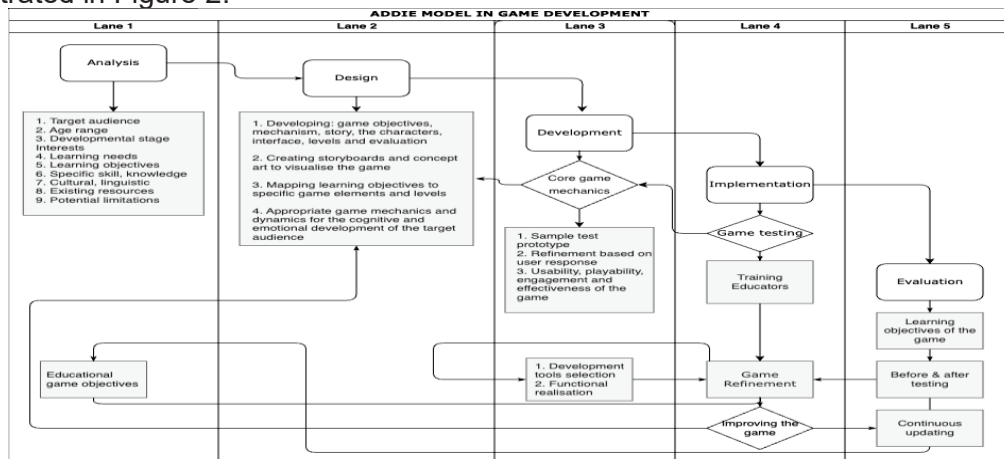


Figure 2. The ADDIE Game Design Process

## 4. The Production and Design of Educational Games for Children

In this research, we present an educational game flowchart in Figure 3. The flowchart details the different actions and learning objectives of the game.

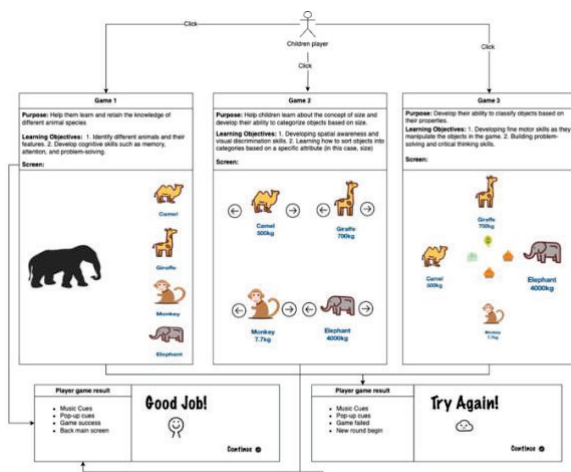


Figure 3. The Game Process

## 4.1 Tool Selection for Development

We present our decision to develop our app on the iOS platform instead of Android. There were several factors that influenced this choice, including the relative ease of development and testing on the iOS platform, and the strong user engagement.

## 4.2 Function Realization

### 4.2.1 The Realization of Game Story

As our primary target audience is comprised of young children, specifically those aged below seven, our game necessitates a theme that is both user-friendly and possesses a more comprehensive storyline, as opposed to a complex user interface.

### 4.2.2 The Realization of User Interaction

As our main audience is under seven years old, we've connected custom buttons to visually appealing elements like tables and classrooms, creating a vibrant and captivating user interface. Utilizing the ADDIE model ensures clear learning goals, content alignment, and mechanics congruence (Kapp, 2012; Lim et al., 2013). Designing personalized educational games for children, aligned with learning objectives, and employing frameworks like ADDIE, constructivism, and scaffolding, can result in immersive and impactful learning experiences.

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