



## **Circuit Smart: Understanding Electricity through Collaborative Learning and Gamification**

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### **ABSTRACT**

This paper explores the use of gamification in providing solutions to overcome learning problems related to electricity on series and parallel circuits in Science for Primary Year 5. The two primary schools involved were in the rural districts of Betong and Lubok Antu in Sarawak. The use of game design thinking as a learning approach was utilised to facilitate the creation of educational games. Modern and traditional games inspired the games produced. Several modifications were re-designed for the game elements to suit the learning context and logistics. The games consisted of online and physical means of conduct where participants could collaborate between two schools and among themselves as a group. The findings obtained by the participants as the players of the games revealed the effectiveness of the games with the combination of computer-supported and collaborative learning in helping them understand the Science topic through play. Online communication, collaborative activities, and knowledge sharing were implemented between the two schools via the internet. The intricacies of the games encourage cooperative and collaborative skills to promote frequent play by adjusting the degree of difficulty of the game mechanics. Future research should enhance students' conceptual understanding with appropriate teaching and learning resources since electricity is a science subject closely related to learners' daily lives.

**Keywords:** game design thinking, Science, electricity, collaborative learning, gamification

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