Fayoum university

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"Interaction between GamificationType and the Academic Persistence In Learning Environment Based On Learning Analytics and Its Effect on Developing Mental Arithmetic Skills and Numerical Fluency for Primary School Pupils"

A dissertation

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By

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Summary

Introduction

The current research is concerned with studying the effect of the interaction between the two types of gamification (badges and leaderboards) and Academic Persistence (high / low) in a learning environment based on learning analytics in developing mental arithmetic skills and numerical fluency for primary school Pupils, using four experimental groups. (The first experimental group used thetype of gamificationbadgeswith a high level of academic Persistence),(The second experimental groupused the type of gamification leaderboards with a high level of academic Persistence, (the third experimental group used the type of gamification badges with a low level of academic Persistence and (the fourth experimental group used the type of gamification leaderboards with a low level of academic Persistence).The research summary illustrates the following: thestatement of the problem, purpose, significance,delimitations, sample, method, variables, research design, hypotheses, instruments, procedures, results, and at the end it presents a number of recommendations and suggestions in light of the research results

Research problem

The deficiencyin the mental arithmetic skills and numerical fluency among primary school Pupils. The current research attempted to overcome this problem through revealing the effect of the interaction between the type of gamification and Academic Persistence in a learning environment based on learning analytics in developing mental arithmetic skills and numerical fluency among Primary school Pupils.

Research Questions

The current research worked on solving this problem through answering the following main question: "What is the effect of the interaction between the type of gamification and Academic Persistence in a learning environment based on learning

analytics in developing mental arithmetic skills and numerical fluency for primary school Pupils?"

The main question is branched out into the following sub-questions:

1. What is the proposed scenario for designing a learning analytics environment based on the interaction between two types of gamification (Badges – leaderboards) and the level of academic Persistence (high - low) in developing mental arithmetic skills and numerical fluency for primary school Pupils?
2. What is the effect of the interaction between the type of gamification and academic persistence in a learning environment based on learning analytics on developing mental arithmetic skills for primary school pupils?
3. What is the effect of the interaction between the type of gamification and academic persistence in a learning environment based on learning analytics on developing the numerical fluencyfor primary school pupils?

Research Objectives

The current research aimed to develop mental arithmetic skills and numerical fluency for primary school pupils and to identify the effect of a learning environment based on learning analytics with two types of gamification (Badges – leaderboards) to develop these skills

Research Significance

The current research may be useful in:

- Providing Gamification environment based on learning analytics to develop mental arithmetic skills and numerical fluency for primary school pupils.
- Providing primary school mathematics teachers with a learning environment based on learning analytics that they can use to develop mental arithmetic skills and numerical fluency for primary school pupils.
- Providing a test for mental arithmetic and numerical fluency that may be beneficial for both teachers and students in the evaluation process.

- Providing a suggested unit in mental arithmetic that might be inserted in the sixth grade primary mathematics textbook.
- Directing the attention of those responsible for designing programs and courses to the importance of Gamification and their role in developing students' skills and the necessity of using them to improve the teaching and learning process.
- Determine the design standards that should be taken into account when developing Gamification environments based on learning analytics for both researchers and designers.

Research limitations

- Objective delimitations: the two types of gamification (badges and leaderboards) and Academic Persistence (high / low)
- Contentdelimitations: A proposed unit that includes the different calculations processes (addition - subtraction - multiplication - division) for natural numbers.
- Human delimitations: A group of pupils at the six grade primary stage at Muhammad Maabad Primary School-Fayoumgovernorate.
- Spatial delimitations: Muhammad Maabad Primary School-Fayoum Governorate.
- Time delimitations: The second semester of the year 2022/2023.