

Original Article (Quantified)

# Studying the effect of educational simulation based on educational technology and academic goal orientation with regard to the mediating role of academic self-efficacy on academic performance

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## Abstract

The purpose of this research is to study the effect of educational simulation based on educational technology and academic goal orientation with regard to the mediating role of academic self-efficacy on academic performance. The current research is applicable in terms of purpose, and descriptive-correlative in terms of its nature, with path analysis approach. The statistical population of the research includes 575 students of geography at Babol University, 234 of whom were selected by stratified random sampling using Morgan's table. To collect the research data, four questionnaires were used: a researcher-made simulate learning based on educational technology, the standard questionnaire of Middleton and Midgley (1998), the academic self-efficacy of Morris (2001), and the academic performance of Pham and Taylor (1999). The face and content validity of the questionnaires were confirmed by the methods of judgmental and construct validity, and the reliability of the tool was approved using Cronbach's alpha coefficient in a preliminary study for the learning simulation questionnaire based on educational technology was 0.79, goal orientation 0.91, academic self-efficacy 0.83, and academic performance 0.90. Data analysis was done using Pearson's correlation coefficient analysis and path analysis in SPSS and Lisrel statistical software. The results showed that educational simulation based on technology and academic goal orientation and academic self-efficacy have a positive and significant effect on the academic performance of students. It was also found that the mediating role of academic self-efficacy in influencing the educational simulation based on technology and goal orientation on Academic performance is positive and meaningful.

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## Extended abstract

### Introduction

One of the main preoccupations of mankind throughout the ages has been to make the future generation capable of managing their own affairs and handing over cultural heritage. Most of this duty was done by the family at first. Simultaneously with the expansion of societies and the division of social and economic work, the task of education was assigned to the institution of education. This institution has officially undertaken this task to identify the abilities and talents of children and teenagers based on the principles and goals accepted by the society and to teach them the necessary teachings in order to socialize and assume future responsibilities. In the continuation of this serious responsibility, the university takes the responsibility; the students acquire a positive or negative attitude towards themselves and the surrounding environment during their studies. This issue depends in a wide extent on the students' successful or unsuccessful experiences during the education. They are placed in the path of growth in the educational environment. In fact, during the best years of their lives, they interact with various factors affecting cognitive, emotional and social development. In addition to academic growth, they also achieve mental health by performing well in education and increasing the amount of learning. On the contrary, in case of failure in academic performance and the resulting psychological pressures, their mental health will be disrupted and such damages will be inflicted on them and the society (Ebrahimpour, 2019). In the definition of academic performance, researchers state that it is a set of academic behaviors that are shown in the two dimensions of academic progress or academic regression in the field of information acquisition. Of course, this performance can also be shown in connection with other academic factors such as classroom and university activities and communication with classmates and professors (Paloş et al, 2019). According to Pham & Taylor (1999), academic performance includes components such as self-efficacy, emotional effects, planning, lack of outcome control, and motivation (Nouraldi, 2021). Self-motivated students, especially when faced with problems, show more hard work and perseverance than people who doubt their abilities. When the perception of academic efficiency in students is high, they will participate in activities that accelerate the development of their skills and abilities. (Babaei Parsheh & Mosadeghi Nik, 2022). Based on what was discussed, the main research goal is to answer the question: whether educational simulation based on educational technology and academic goal orientation with the mediating role of academic self-efficacy has an effect on the academic performance of geography students?

### Theoretical Framework

#### Academic Performance

Academic performance means the ability of students to answer questions related to the specific subject or topics foreseen for an educational course (Sepehvandi, 2017).

#### Educational simulation

Simulation is a version of some real devices or work situations and tries to display some behavioral aspects of a physical or abstract system by the behavior of another system (Bruschi et al, 1999). In simulation, using a simulator in a fake situation, it is possible to recreate the real effects of some possible conditions (Nouri, 2015). In fact, simulator software provides for the learner environments that are most similar to the real one, and at the same time, they are not as costly and risky as facing the real environment. This can be effectively used in education (Swain et al, 2008).

### **Academic goal orientation**

Academic goal orientation is one of the approaches that have attracted the attention of theorists and researchers in the field of motivation to progress as a "cognitive-social" approach, in which the concept of goal and goal orientation play a central role (Bejnordi Shligani & Suleiman Pourimran, 2018).

### **Academic self-efficacy**

Self-efficacy is confidence in one's ability to control one's thoughts, feelings, and activities; and therefore is effective on the outcome of actions. Self-efficacy expectations are effective on people's actual performance, emotions, behavior choices, and finally, the amount of effort spent on an activity (Zamani Amir, 2018).

Mohammadi et al, (2023) investigated the evaluation of factors affecting the development of cloud-based accounting education and students' academic performance. This research examines the degree of acceptance of using cloud computing methods in the teaching of accounting courses and its effectiveness in the education process by the students of Iranian universities by using the influence of external variables, i.e. human factors, economic and technological factors, and cultural and social factors on the development of cloud accounting education, and determines the academic performance of students. The research results indicate that human, economic and cultural factors have a significant positive effect on the development of cloud-based accounting education and students' academic performance.

Penalo (2023) investigated the effect of the pre-justified-explanatory educational strategy of virtual simulation on the self-efficacy of nursing students and the performance of virtual simulation. The results showed that the effect of pre-justified-explanatory educational strategy of virtual simulation on students' self-efficacy and virtual simulation performance is positive and significant.

### **Research methodology**

The current research is applicable in terms of purpose, and descriptive-correlative in terms of its nature, with path analysis approach. The statistical population of the research includes 575 students of geography at Babol University, 234 of whom were selected by stratified random sampling using Morgan's table. To collect the research data, four questionnaires were used: a researcher-made simulate learning based on educational technology, the standard questionnaire of Middleton and Midgley (1998), the academic self-efficacy of Morris (2001), and the academic performance of Pham and Taylor (1999). The face and content validity of the questionnaires were confirmed by the methods of judgmental and construct validity, and the reliability of the tool was approved using Cronbach's alpha coefficient in a preliminary study for the learning simulation questionnaire based on educational technology was 0.79, goal orientation 0.91, academic self-efficacy 83 0.00, and academic performance 0.90.

### **Research findings**

Data analysis was done using Pearson's correlation coefficient analysis and path analysis in SPSS and Lisrel statistical software. The results showed that the educational simulation based on technology and academic goal orientation and academic self-efficacy have a positive and significant effect on the academic performance of students. It was also found that the mediating role of academic self-efficacy in influencing the educational simulation based on technology and goal orientation on academic performance is positive and meaningful.



## Conclusion

The present research was conducted with the aim of studying the effect of educational simulation based on educational technology and academic goal orientation with regard to the mediating role of academic self-efficacy on academic performance. The results of this research are in agreement with the results of Rajabiyani et al, (2021), Eslami Kelantari (2020), Rajabiyani et al, (2020), Alhadabi & Karpinski (2020), Salehzadeh (2019), Mahtari Arani et al, (2018), Penalo (2023), and Shafiq & Parveen (2023). Alhadabi & Karpinski (2020) showed that the relationship between achievement orientation goals and academic self-efficacy was reported to be positive and significant. Penalo (2023) showed that the effect of pre-justified-explanatory educational strategy of virtual simulation on students' self-efficacy and virtual simulation performance is positive and significant.

According to the results of the research, it is suggested to the faculty members that in order to improve the mental skills and academic performance of the students, they should first teach the principles and concepts to the students, and then, along with the traditional methods and as a supplement of educational simulation for practical skills, use the educational simulation for practical and applicable skills.