Orginal Article

From Secondary Education to the Healthcare Fields: Exploring the Feasibility of English Content-based Instruction of Reading Sciences along with Games for Lifelong Learning

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Introduction

Reading comprehension skills are the cornerstones of lifelong learning of sciences. The confluence of science, technology, engineering, art, and mathematics has currently ushered in the close collaboration of English teachers with subject area teachers in non-English speaking countries to highlight the possible benefits of new methods of teaching and learning sciences (e.g., Content-Based Instruction or CBI) through English. In tandem, the integration of Augmented Reality Games (ARGs) into flipped classrooms has made provision for students to preemptively tackle the challenges that they are likely to face in the professional contexts. As such, the experiential comprehension of reading sciences introduces the concept of lifelong learning.

Method

This longitudinal study, using a sequential explanatory design and adopting co-teaching in the social constructivism throughout the academic years 2019-2021, explored the feasibility of CBI through English in the pre-reading flipped classrooms for the lifelong learning of secondary and postsecondary sciences. Using the design of experiments, 721 Persian and non-Persian male and female high-school students majoring in applied sciences were selected in the margin errors of 1%. The participants were then randomly divided into four groups to learn the sciences through CBI in the (non)-ARG-assisted flipped classrooms. To fulfill complementarity, the process of CBI in the (non)-ARG-assisted flipped class continued with

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teaching and formative assessment of the participants' reading comprehension skills in both instruction-learning and healthcare contexts, along with a survey and a focus-group interview. While the quantitative data were analyzed through the Wilcoxon signed-rank test, Spearman's correlation coefficient, the repeated measures ANOVA, and the linear mixed effects model, the qualitative data were analyzed through MAXQDA.

Results and Discussion

Descriptive and inferential analyses of the data revealed the feasibility of CBI in the ARG-assisted flipped classrooms for teaching reading comprehension skills of sciences in both secondary and medical postsecondary education which, in turn, paved the way for lifelong learning ($\beta = 6.9$, $p < .05$). From the participants' viewpoints, adopting an active role in doing the ARGs in the process of CBI of reading sciences facilitated their reading comprehension in favor of lifelong learning.

Conclusion

The findings revealed that English communication between students and co-teachers for the completion of the reading activities contributed to students' lifelong learning of reading comprehension skills.

Keywords: Content-Based Instruction, Reading Comprehension, Augmented-Reality Game, Flipped classroom, lifelong learning.