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The Effects of Virtual Classroom & Virtual Labs and Internet on Learning as A Triangle Interaction(*)

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أثر التفاعل الثلاثي بين الفصول والمختبرات الافتراضية والإنترنت على التعلم

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الملخص

تهدف هذه الدراسة إلى استخدام تقنيات المحاكاة القائمة على تقنية الفصول الافتراضية (V Class) والمختبرات الافتراضية (VLabs) ودعم الإنترنت (IntSup) والتي تكون مثيرة للاهتمام وسهلة الاستخدام من قبل أفراد العينة (الصف الثامن) للحصول على المقررات الالكترونية بالشكل الأمثل من أجل استخدامها في التعلم في أي مكان وزمان. واستخدمت هذه التقنيات مقرر الرياضيات (النظري – العملي) في بعض المدارس الحكومية في مدينة تعز الجمهورية اليمنية باعتبارها أهم أدوات عصر المعلومات والتي يمكن استخدامها في كل مرحلة من مراحل النظام التعليمي. وتم تصميم هذا البحث لدراسة مدى تفاعل الطلاب في المرحلة الأساسية بشكلٍ عام لاستخدام برامج المحاكاة VClass وVLabs المدعمة بالإنترنت في ثلاثة الأبعاد ومعرفة قدراتهم ومهاراتهم ومعارفهم العملية والعملية.

إن التفاعل بين هذه الأبعاد الثلاثة هو الغرض الرئيس من هذه الدراسة لدمج التكنولوجيا في النهج التعليمي الحالي وإدخال تقنيات جديدة كأداة مهمة لدعم طرق جديدة للتدريس والتعلم. تم إنشاء واختبار نموذج يشرح تأثير V Class وV Labs وIntSup وTeach Online على التعلم. باستخدام برنامج AMOS 21 (تحليل الهيكلة البنائية) حيث شرح (100%) أدوات V Class، (46%) أدوات V Labs، Intsup (91%)، و(83%) أدوات التدريس عبر الإنترنت مع ملاءمة جيدة للنموذج، وقد أشارت نتائج هذه الدراسة إلى قبول جميع الفرضيات.

الكلمات المفتاحية: المعامل الافتراضية، الفصول الافتراضية، دعم الإنترنت، التدريس عبر الإنترنت.

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Abstract

This study aims to use virtual classroom (V Class), Virtual Labs (VLabs), and Internet Support (IntSup) technologies-based simulations that is interesting, easy to use by participants and streamline the time of technical teachers in bringing the technical materials as well as feasible to be used in learning anywhere and anytime. These technologies used both the practical of math course and theory in the government schools in Taiz city, Yemen as the most significant tools of information age and could be used in each stage of education system. This paper has been designed to study the adoption of the participants of the general class towards the VClass and VLabs simulations' usage with Internet support in three dimensions of their abilities, practical skills and knowledge. The interaction between these dimensions is the key purpose of this study to integrate technology in existing educational approach and introduce new technologies as an important tool to support new ways of practical teaching and learning. A model, which explains the effect of V Class, V Labs, IntSup and Teach Online on learning, is established and tested. Using AMOS 21 (Analysis of Moment Structures) program, it explains (100%) of V Class tools, (46%) of V Labs tools, (91%) of Intsup and (83%) of Teach Online, with good model fit. All hypotheses are accepted which is indicated by the findings of this study.

Keywords: Virtual Labs, Virtual Classroom, Internet Support, Online Teaching.

Introduction

Simulation is an experiential instructional method that teachers create to imitate or replicate actual events, problem procedures, or skills to achieve the desired instructional results [1]. The role of simulation to teach and access open surgical skills has become more prevalent in recent years [2]. The growing popularity of simulations and games invites the production of insights that help academic teachers to use simulations and games in their courses [3]. Exploring the many ways simulation can be used in the classroom, consider the perspective of international teachers of English language, [4]. A good example of how simulation is applied to demonstrate the human factor in structured academic social situations in the fields of STEM as educators consistently seek innovative ways to teach ethics in science and math. As with any teaching method, simulation has its proponents and critics. Among advantages pointed out by [4] and other simulation supporters, mostly agree such as simulation increases students' interest and motivation in the topic being studied. It makes the material more realistic and relevant when compared to the traditional approach to education.

Objectives.

1- To interact with the best way of virtual classroom Simulation (VClass).
2- To study the important effects of virtual labs Simulation (VLabs), on education.

Related work

The technology of Synchronous techniques can add value to teaching and learning models as a replacement for face-to-face or asynchronous learning [13]. The study of [12] investigated the effects of live virtual classrooms on students' achievement and to determine students' opinions about the live virtual physics classroom at distance learning. At the live virtual physics classroom, this study presented physics lessons. Midterm, final and make-up scores were examined after the LOC instruction. Students who are LOCFF joined over (50%) percent and they had significantly higher scores than students who are LOCFR joined below (50%) percent to the lessons. According to test results, LOCFF group was more successfully than LOCFR group. Many education systems around the world have recognized the value of using technology such as virtual laboratories to teach science subjects. The study of [10] aims to explore the effectiveness of using a virtual laboratory on grade eight students in learning about electricity-related topics. The result indicated that the virtual laboratory significantly enhanced students' achievement in electricity-related topics more than the physical laboratory. These findings could be attributed to how students learn using the virtual laboratory. The findings of the research have provided several important implications for curriculum designers and science education. The development and increasingly widespread use of digital computing technologies in school science provides new tools for

gathering, visualizing, and reporting data and findings, as well as supporting science learning, particularly in supporting science laboratories. Multimedia and the web make it possible to simulate laboratories and schools can now offer students virtual laboratories via the internet or multimedia [11].

[9] investigated the effect of utilizing interactive virtual lab (Labster) on students' performance in physics among the grade 10 of Dungoan High School. Students' performances were measured using a 40-item test that undergone pilot testing and content validation. Results revealed that the significant increase of students' performance in the experimental group provides positive effect It was found that the use of Labster contribute on enhancing students' learning in physics. Results in the rank gain scores with a significant difference in two groups revealed that Labster also developed positive attitude towards learning physics with large Cliff's effect size difference of d = (0.71). Thus, there was a significant difference between the experimental and control group. The qualitative part of this study revealed that students' perception in utilization of Labster was a great technological integration in terms of learning contents, interface design, and learning experiences with a weighted mean of (4.08), (4.34), and (4.72) respectively. Moreover, the experimental group experienced difficulties while using Labster such as (1) program incompatibility with lower processor; (2) incapability to perform tasks with more than two activities at a time; and (3) insufficient computer literacy.

The virtual classroom is a product of the central processes of globalization. Teachers and students separated by vast amounts of space can interact with the printed text and the electronic signal anywhere and anytime. The separation of time and space creates latitude for social action and reaction that may violate the conventions of face-to-face classrooms [8].

Methodology and Statistics

The method adopted for the present study is experimental and statistical in nature. It provides a framework which is flexible for selecting learning materials and participants, defining criteria and measures, and implementing evaluation techniques. By adapting these different techniques, the proposed structure model for VClass, VLabs and IntSup aims to assess the relationship between them. To assess the relationship between interactive VClass, VLabs and IntSup; A model, which explains the effect of VClass, VLabs, IntSup and Teach Online on learning, is established and tested. Using AMOS 21 (Analysis of Moment Structures) program. Different statistical techniques were used including instrument development, a confirmatory factor analysis (CFA), Principal Component Factor and Cronbach's alpha, (exploratory factor analysis (EFA) is used to determine how many latent variables would be used)), Construct Reliability, and a test of a structural model. Convergent validity and Discriminant validity were used in this research according to the recommendations of **[5].** To assess the fit of the model to the data, Chi-square per degrees of freedom P= (0.160), GFI=

(0.97), AGFI= (0.91), CFI= (0.99), RMSR= (0.030), and RMSEA= (0.039) were computed. If the model fits the data adequately, the t-values of the structural coefficients will be evaluated to test the research hypotheses. Figure 1 illustrates proposed Teach Online Model below.

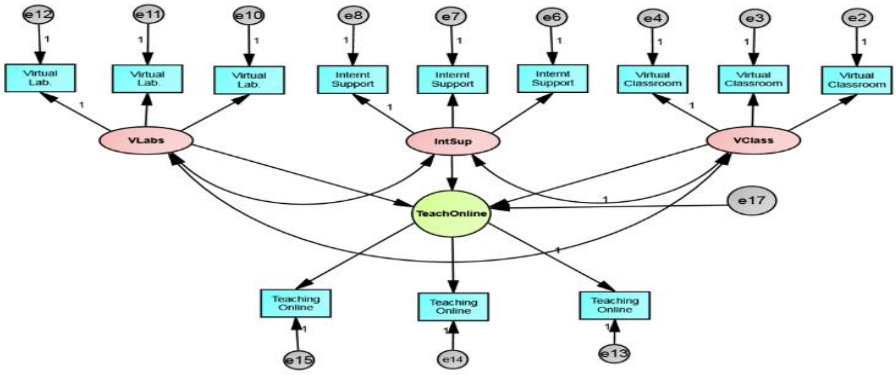

Fig1. Teach Online Model

Research Hypotheses

H1: There is a positive relationship between vLabs and IntSup;

H1: There is a positive relationship between vLabs and vClass;

H1: There is a positive relationship between IntSup and vClass.

Population and Sample

The difficulty of studying the whole population enforces the researcher to randomly, choose a sample of (200) of students. The reliability of the constructs of VClass, VLabs,

and IntSup were (0.98), (0.97), and (0.97), respectively. All constructs exceeded the recommended level of (0.70) **[6].** A model, which explains the effect of VClass, VLabs, IntSup and Teach Online on learning, is established and tested. Using AMOS (21) (Analysis of Moment Structures) program, it explains (100%) of VClass TOOLS, (46%) of VLabs tools, (93%) of Intsup and (83%) of TeachOnline, with good model fit. All hypotheses are accepted which is indicated by the findings of this study.

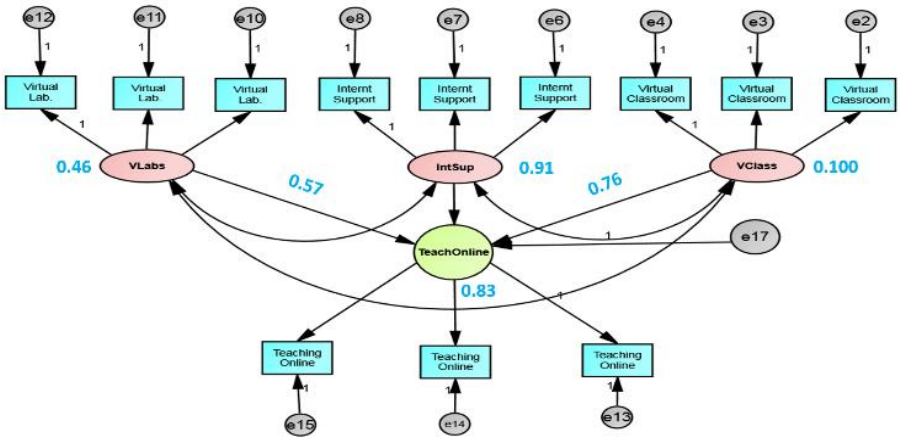

Fig2. Standardized Teach Online Model

Discussion

This study accepts the same result as the study of [12] and [8] which investigated the effects of live virtual classrooms on students' achievement and to determine students' opinions about the live virtual classroom and differ in the course from physics to math. It supports the findings of [10] in the use of virtual laboratories to teach science subjects and using multimedia to support the understanding of simulate

laboratories and science learning. So that it tends to identify, within the framework of ([7], [10], and [11]). It has investigated the underlying relationships between VClass, VLabs, IntSup and TeachOnline which support learning and teaching for class. All hypotheses are supported using structural model. Having its stronger impact on ability, practical skills and knowledge, it is emphasized that virtual classroom and virtual labs with the support of the Internet are required in the class for receiving knowledge through practical simulation anywhere and anytime.

Conclusion

Many researchers may build on this model to identify and examine other factors that may influence learning to use simulation such as the biology, chemistry, and science skills that support Teach Online, including the different levels of information technology of organizations and virtual resources.

This paper has been designed to study the adoption of the participants of the general class towards the VClass and VLabs simulations' usage with Internet support in three dimensions of their abilities, practical skills and knowledge. The interaction between these dimensions is the key purpose of this study to integrate technology in existing educational approach and introduce new technologies as an important tool to support new ways of practical teaching and learning. A model, which explains the effect of VClass, VLabs, IntSup and Teach Online on learning, is established and tested. Using

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