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Effect of Blackboard on Teaching Communication Skills: Cognitive Development and Student Satisfaction

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Abstract

This study examines the effectiveness of Blackboard as a virtual learning platform for developing course-related knowledge and assessing student satisfaction. Interactive Blackboard content was created for the communication skills course, and students were trained to use it. The experimental group (39 students) engaged with Blackboard as part of blended learning, while the control group (39 students) followed the traditional learning approach. An achievement test and satisfaction survey were administered. The results showed no significant difference in achievement levels between the groups, but 27 survey questions indicated high satisfaction with Blackboard. The study recommends implementing virtual learning environments in university courses to enhance student responsibility, continuous communication, and interaction with instructors and peers.

Keywords: *Blackboard, Virtual Learning Environments (VLE), Communication Skills, Cognitive Domain, Student Satisfaction.*

1. Introduction

The evolution of IT-related science and its utilization in all aspects of life has contributed to making Internet use a key requirement of modern life, especially Internet applications in education, which in turn demonstrated the concept of VLEs (software or system that supports the process of direct and indirect communication, between the parties in the learning and teaching process, through computers and the Internet). It follows that some higher education institutions have made educational use of these new technologies which employ VLEs to enrich educational processes with the increasing number of learners; attention has begun to be paid to online curriculum development by using the idea of VLE programs. (5) (Alqahtani & Rajkhan, 2020).

VLEs are based on different strategies of teaching methods that differ from traditional methods (11) (Iffat,2021), where it is based on the employment of the educational interaction component. The interaction element in educational communication is important; it links all pre-communication elements together and makes them useful in the teaching and learning process. This means the influence that occurs between the teacher and his students on the one hand, among students, their peers and educational activities on the other hand. Interaction also involves feedback through subject learning. (7)

The Buntak & Kovačić study (8) confirms the success of online learning and interaction versus face-to-face interaction. It demonstrates that there are no differences between these two types of interaction if learning occurs in the same circumstances and the same

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learning conditions. The Alqahtani & Rajkhan (5) study emphasizes the development system in contemporary university learning to reduce the negative outcomes of the traditional methods used in university education and direct the financial capabilities of universities to provide the appropriate environment for the dissemination of contemporary culture based on positive interaction.

E-learning was the best option over face-to-face learning under the Corona pandemic, where education officials in most countries of the world turned to it; the demand for software, applications and devices used in E-learning increased as a healthy safe alternative with the presence of Covid-19, while supporting the teaching and learning processes in general and higher education.

Virtual universities are one of the applications of VLEs that offer online study programs in all disciplines and many university professors participate in the design of these programs, in collaboration with system managers who contribute to support distance learning. It has become customary to offer online study programs, there are many online programs for different qualifications and degrees. (4) (Almufarreh, A., & Mohammed, S.,2021)

In light of the above, it is important to employ VLEs in university education at all stages to benefit the development of the educational process, support the student as a participant in the educational process, and activate collaborative learning methods among students.

The researchers have therefore employed Blackboard in developing E-courses by building the communication skills course on the system, activating it with students and taking their views on the feasibility of using the course in developing their performance and learning process, and their acceptance of the new system as opposed to the old system.

This research focuses on the following issues: To what extent is building courses in the Blackboard system useful for preparatory year program (PYP) students at Imam Abdulrahman bin Faisal University (IAU)? To what extent students are satisfied? What are the barriers to implementing and developing the IAU's VLE system to achieve the best outcomes?

Statement of the Problem:

IAU develops educational systems and methods within it by introducing the latest technological methods in education. One of the methods applied by the university is the Learning Management System (LMS), through the Blackboard course management system so that it works with traditional methods of teaching in an integrative manner.

The research problem arose when researchers noticed students' and the faculty's fear of applying the new system and interacting through it as an alternative to interaction in traditional ways. The insufficient faculty experience in activating the system and the inadequate experience of students to interact through Blackboard are the reasons behind this problem. Also, students with insufficient computers and inadequate internet expertise are required to interact through Blackboard, to be able to interact directly with the teacher and their colleagues. While the system required them to interact indirectly, there was also an important point noted by the two researchers; students were not convinced of the usefulness of the system in supporting their learning.

The Blackboard system merely applied and used technology to no actual effect in the learning process. In light of this, has the problem of research arisen? Are students' opinions different after training on Blackboard, interacting with it and studying the content of the course? Do students feel the importance of applying the system at the university as one of the methods that supports, develops, and facilitates the educational process or will their thinking remain the same?

Research Questions:

In the light of the above, the research problem can be confined to the following research questions (RQs):

1- What course content will be activated through virtual learning environments by Blackboard?

2- What different interaction methods will be employed in the virtual learning environment?

3- How effective is the application of the Blackboard system to develop the knowledge aspects associated with the content of the course between the experimental and the control group.

4- What is student satisfaction with the use of virtual Blackboard learning environments in their academic courses?

Research Objectives:

The current research aims to:

1- Build a virtual learning environment through the Blackboard system.

2- Training students in the use of E-learning technology in the learning process.

3- Recognize student satisfaction towards the use of the Blackboard system in the preparatory year (first university year).

4- Study the differences in achievement between the control group studied in a traditional way and the experimental group studied with Blackboard as a VLE.

Research hypothesis:

- There are no statistically significant differences in measuring the cognitive aspects of the communication skills course between the experimental and control groups in the post application.
- Student satisfaction towards employing virtual learning environments by Blackboard in their university courses is positive.

The importance of research:

Current research contributes to develop the learning process by applying VLE, activate the Blackboard system in curricula in IAU, hinge on the obstacles to the application of the system, and keeping abreast of recent global trends in education and learning and trying to activate them.

2.Theoretical framework:

Blackboard virtual learning environments support systems:

Many types of software support VLEs, but the Blackboard model is one of the leading environments in this field, which is used in universities as one of the virtual systems to manage the educational program. it has many distinct high-level tasks and important for both student and teacher, such as facilitating content building within the virtual environment, as well as the provision of student evaluation tools in the light of the evaluation rubric and university standards, provide all possibilities for meetings and providing immediate interaction methods for students (7). (Bessadok& Rabie,2021)

Blackboard Features:

- Build and provide educational media and materials for students to use anytime anywhere.

- Provide the practical links needed to build the course's content and information on participants, university assignment, activities, and tasks, all without knowing the programming languages used to create web pages.
- Easy to add Video Clips, PowerPoint files, Word files, Excel Files, and other sources of educational materials.
- Provide communication tools that support communication, dialogue, discussion between students and teachers.
- Help students to have a role in the education process and teach each other using the Discussion Board.
- Easy to manage conversations and discussions for the teacher and the existence of tools that make it easier to build tests and questions through the features of evaluation available in this system.
- Easy build of various forms of questions, like multiple choice questions, True/False, matching questions, etc.
- Build statistical reports on students' answers and provide students with immediate feedback.
- This system performs effective practical functions by helping to provide the possibilities for the teacher and the administrators of the university to disseminate all data and information about the programs, as well as by presenting documents, writing reports and comments in a normal and familiar manner.

Basic Components of Blackboard System (3): (Alghafis & Abdulghany, 2020)

When building courses through Blackboard, the following elements must be considered:

1- Announcement:

We must use announcements regularly to guide the learner during the course to assignments, tasks, and evaluation methods.

2- Course's information:

Course description should be prepared, specifying the educational objectives (outcomes), content and grading distribution system.

3- Information on the faculty member:

The teacher must identify information about him, teaching hours, schedule, office hours and how the student can contact him.

4- Assignments and tasks:

The teacher must determine the assignments required of the student at the beginning of the course.

5- Organization of the list of contents:

It is necessary to organize and control a list of the most important components of the course, through the Blackboard system, in terms of adding keys to connections based on content, components and internal interaction methods.

6- External links:

External links to the course must be added online to support the course's content.

7- Content management: (10) (Gajendran,2020)

* A general plan must be developed for the course to define its components and to identify the content elements in a serial and logical context of the content files.

* Use the announcement method permanently when we add or modify the content or display any new information to the learner.

* Building content using ready-made models to help the learner to navigate the content in a logical way.

8- Add scientific content:

When we add the content, we must clearly explain each element, its relevance to the course, and how it relates to the achievement of the course objectives.

9- Evaluation:

It is necessary to build methods for evaluating the learner and to follow up the usage statistics, interaction, and student progress to evaluate and follow up the course on Blackboard.

10- Protection system:

* Show or not show keys, or links where elements that appear to the learner can be determined once, or gradually so that we determine the time and date of each item.

* Control the availability of the entire course content or part thereof to the student.

11- Interactive:

* Build asynchronous interaction methods which allow interaction and participation with time variation, such as discussions and mailbox.

* Providing synchronized interaction methods requires the learner's participation at the same time as the conversation.

12- Composition of groups:

* The teacher must make a record of student groups, focusing on interaction and collaborative work between them.

13- Office hours:

* Teachers must identify online office hours where they are present with students at the same time.

* The course's content must be linked to additional external links, such as educational websites available online.

14- Users' management:

* The role of students: Each learner's role must be determined and ensure that everyone understands their role well and how to interact with the Blackboard system.

* Email: Every student has a recent email from which the teacher can follow the student.

3. Literature Review:

- Aboagye & Appiah study, 2021.: (1): The research problem revolves around the importance of educational design of E-courses. Because good design positively affects students' learning outputs, the researcher has presented several effective online educational models considering the characteristics of the online learning environment. As the first generation of design models consisted of five phases: analysis, design, development, application and evaluation, some models were presented: Lee and Paul (Lee, & Paulus, 2001). It identifies a number of components of the educational design process that are included in the web pages (target audience - objectives - start page - browsing structure - text and graphics - selection of the web composition program), as well as presentation of the Klett model (Klett,2003) which includes the following stages:

(Needs Analysis Phase - Learning Output Determination Phase - Content Identification Phase - Learning Strategy Identification Phase - Student Assistance Phase - Production Phase - Application Phase - Evaluation Phase)

- Ncubukezi & Daramola study, 2020, (14): This study discusses the concept of E-learning and its relationship to the concept of inclusive quality in European education "The European Council set its goal by the end of 2010 for education to be at a global competitive level, to this end, the Board has built educational programs at the global challenge level." By building E-learning-based educational programs as a medium to increase the quality and effectiveness of education.

This research discusses the relationship between distance learning and E-learning, involving the use of multimedia and Internet technology, which may or may not include interaction between students with each other and with teachers. Additionally, the research focuses on the concept of inclusive quality and has discussed quality entry points in education.

The study recommends that to achieve the goal of educational development, E-learning methods must be applied in educational institutions to achieve efficiency, effectiveness, and quality.

- Alqahtani & Rajkhan Study,2020 (5): The research problem is about setting standards for online learning:

The researchers built 24 criteria to measure the quality of course building through the Blackboard system. Global standards focus on comprehensive quality standards. The researchers made a questionnaire that measured student and college satisfaction with education through the Blackboard system. The researchers set the maximum scale score of 7. The number of students was 386 and the number of colleges 20. the following results were achieved:

For students: learn new knowledge and skills -6.19, adequacy of interaction in the learning environment -5.97, organizing of educational materials 6.20, students' freedom and encouragement to participate -6.45.

For the College: distance learning efficiency range through the Internet -6.14, online work has a positive impact on teaching -6.24, planning for online teaching in the future -6.67.

- Alamer Study, 2020 (2): The study aims to identify the impact of the use of virtual classes on the achievement of students at King Khalid University Faculty of Education. The problem has been summarized as "the need to know the impact of teaching using virtual classes on the achievement of university students compared to the traditional approach". The researcher used the quasi-experimental methodology research, the one-group model, where he identified the study community and randomly selected from them the Education technology and Communication Course groups and then identified the experimental and control group, thus the sample consisted of 42 students.

The study found that there were no statistically significant differences at 0.05 in the achievement level at the first cognitive level and the second cognitive level. Significant differences have been found in the achievement level at the third cognitive level of application. According to Bloom's classification, it was recommended that the researcher take advantage of the techniques of the global network in education, give home exercises, exchange messages and the technology of virtual classes, especially at the university level.

4. Methods and Procedures:

4.1 Methods:

The approach used in this research is a mixed method. It is purely descriptive. It employs a questionnaire to recognize student satisfaction towards using Blackboard and interaction through it. The other one is experimental by building the course with the Blackboard system, applying it to the students of the experimental group and comparing them with the control group to measure the knowledge aspect of achievement.

4.2 Research Variables:

Independent Variable:

- Build virtual learning environment by the Blackboard system.

Dependent Variables:

- Knowledge aspects associated with the course.
- Student satisfaction towards employing VLE.

4.3 Research Terms:

Online based learning environments: (9)

They are super multimedia tutorials that employ Internet sources and features to create a meaningful learning environment that supports learning processes, such as E-mail, Internet-based teleconference, and discussion panels. (Dwidienawati&Others,2020)

Defining Blackboard learning environment:

It can be defined as a virtual educational environment that can be used in different ways based on building synergistic and asymmetric interactive methods between student and teacher, and between students and others through the Internet, to address deficiencies in traditional learning environments, and to employ modern technological methods to enrich the educational process.

4.4 Procedures:

Building research tools:

1. Building the achievement test:

The researchers built a final achievement test to measure the knowledge aspect associated with the content of the "communication skills" course in the light of the course's specific educational objectives through the following steps:

- Determination of the type of test items:

- The first set consists of 20 true and false questions (10 degrees).

- The second set consists of 60 multiple choice questions (30 degrees).

- Test arbitration:

The test was initially sent to the arbitrators. They indicated the competence of the test to measure the knowledge aspect associated with the course.

- Validity of the test:
  The test was given with a table of specifications and relative weight to (5) arbitrators specialized in teaching scientific research skills, who confirmed that the test and its questions measures what it was designed to measure.

- The pilot experience:

The researchers applied the test to a sample of ten students with the aim of ascertaining:

- The clarity of the test items.
- Set a test time.
- Test accuracy.
- Test stability.

  - Test stability:
    Pearson's correlation coefficient was used to calculate the stability of the test, which had (80) items; It was applied to a sample of ten students at PYP in IAU, the test stability coefficient reached (0.975), which is a high stability coefficient, which makes us reassured to use the test as a measurement tool.

  - Final version of the test:

The test was finalized electronically through the Blackboard system including the following:

- Test instructions.
- Test time.
- Distribution of test degrees.
- Announcing the test date.

2. A questionnaire of student satisfaction towards Blackboard:

This questionnaire was built according to the following steps:

- Questionnaire objective:

The questionnaire is designed to recognize students' satisfaction towards interacting with the VLE through Blackboard, the advantages, and disadvantages of this system and what their expectations are for their learning of other courses.

- Likert model was selected to prepare the questionnaire: The following three possibilities were developed to answer each of the questionnaire statements: Yes, to a large extent – Yes, to a moderate extent - No (I refuse).
- Measuring of the validity of the tool: The questionnaire was prepared in its preliminary form and presented to a group of arbitrators specializing in the curricula and methods of teaching, as well as specialists in E-learning, to identify their views in the phrases of the questionnaire by amendment, deletion, and addition. Some arbitrators made their observations by amending certain phrases' wording, and deleting some phrases that are implicitly achieved in other phrases.

  - Questionnaire Pilot study:

A survey experiment was conducted on some students to determine the extent to which the phrases were understood, clarified, sequenced, and related to the subject matter of the study. The phrases were amended in the light of the sample's exploratory responses.

  - Final version of the Questionnaire:

The final version consists of (30) a diverse phrase that expresses students' views towards the VLE. The questionnaire included three main domains measuring students' views towards:

1- Methods of synchronized and non-synchronized interaction.

2- The extent of utilization of the course's achievement.

3- Application of the experiment in other courses.

- Questionnaire correction grades:

Table (1) Shows by grades of Questionnaire.

towards eLearning using Blackboard

Domain	Yes, to a great extent	Yes, to a moderate extent	No (I refuse)
Statements	2	1	0

Since the questionnaire contains (30) statements, the highest score of the questionnaire is (60) and the lowest score is (0).

Building a Blackboard skills course:

At this stage, the researchers built the Blackboard communication skills course, building all interactive methods and training students on them. The following is a detailed presentation of what was built with the VLE.

Building different interaction methods through Blackboard:

At this step, the researchers built synchronized and asynchronous interactions in the VLE, illustrated by the following tools:

- Email.
- Groups discussion.
- Conversation forums.

Building evaluation and follow-up methods through Blackboard:

At this stage, student assessment and follow-up methods were built and trained to interact with the VLE through Blackboard.

Exploratory experience:

After making the required modifications, the pilot experiment was conducted on (10) students to ascertain the clarity of the scientific material contained in the VLE, the appropriateness of the content for the learner, the clarity of the shapes, images, the acceptance of the content of the program, activation of all link and making sure that it works efficiently as well as the interaction methods built through the system.

The results of the pilot experiment illustrated some modifications to suit the presentation of the scientific subject through Blackboard with the level of students, ensure that the content is displayed with various means and the ability to participate effectively during the implementation.

Research groups:

The experimental research group consisting of 39 students was selected to interact with the learning system through the VLE of the Blackboard system as well as traditional method (blended learning) and the selection of the control research group consisting of 39 students from the communication skills course, who studied the course in the traditional way only.

Research pilot implementation:

After finalizing the research tools and building the VLE with Blackboard, the researchers performed the following:

- Teaching face to face in addition to applying the Blackboard system to the students of the experimental group by building the course of communication skills on the Blackboard, as well as activating the following: E-mail, E-discussion via a forum created specifically for them.
- Teaching face to face to students of the control group in the traditional way.

- Applying the achievement test to students of the control group.
- Applying an achievement test through the Blackboard to students of the experimental group inside the classrooms in instructor's presence.
- Applying a questionnaire to measure students' satisfaction toward learning through the VLE.

5. Results

RQ1: Statistical presentation of results:

- What course content will be presented through the VLE by Blackboard?
- The content of the communication skills course was developed and distributed over 16 weeks as follows:

  Week 1: Communication concept, importance of communication, elements of communication.

  Week 2: Methods of verbal and non-verbal communication.

  Week 3: Effective presentation skills.

  Week 4: Specifications of effective presentation.

  Week 5: Concept, forms, and areas of volunteerism.

  Week 6: Teamwork skills.

  Week 7: Dialogue and persuasion skills.

  Week 9: Negotiating and leadership skills.

  Week 10: Electronic communication.

  Week 11: Self-awareness.

  Week 12: Ways to build personal relationships.

  Week 13: Social intelligence.

  Week 14: Human patterns and how to deal with them.

  Week 15: Personal interview and CV writing.

  Week 16: Writing reports.

- The activities and tasks were also distributed to students electronically, as follows:

- Task 1: login to Blackboard and write two questions to the instructor weekly.
- Task 2: Analyzing communication skills in a student's life situation.
- Task 3: Writing a report.
- Task 4: CV Writing.
- Task 5: Undertake voluntary work.
- Task 6: Prepare a presentation on volunteerism.

Grades have been distributed to tasks.

RQ2:

- What different interaction methods will be employed in the VLE?

Different synchronized and asynchronous interaction methods were built and utilized through the VLE of Blackboard. The interactive methods were as follows:

1- Building interactive asynchronous methods:

* Course document.

* Course description

* Periodic announcements

* Course assignments

* Distribution of task scores

* Email for groups

* Forum and Discussion Room

* A digital drop box (add file -send file)

* Exchange of sites and ideas

2- Building interactive synergistic methods:

* Collaboration session.

* Virtual classroom environment - lecture hall

* Direct contact with teacher through office hours

* Chat room.

* Smartboard.

* Ask question - question in box

* Blackboard virtual classroom - lecture hall.

RQ3:

- How effective is using Blackboard to develop knowledge aspects associated with the course content between the experimental group and the control group?

Which is expressed in the following statistical hypothesis:

- There are no statistically significant differences to measure the cognitive aspects associated with the communication skills course between the experimental group and the control group in the post applying.

To measure the statistical hypothesis, an achievement test was built and applied after the experimental group that studied the course through face-to-face teaching and the Blackboard together (blended learning), and the control group that studied the course in the traditional way. The results showed that:

Table (2) shows data description of the of experimental and control groups

Descriptive statistics	Control group	Experimental group
Mean	79.66	78.97
Median	80.000	80.000
Variance	28.33	59.39
Standard Deviation	5.32	7.70
Less value	70	60
Biggest value	92	96
Range	22	36
Skewness	0.07	-0.379

Table (2) shows statistical analysis of the final cognitive test scores which has been applied (post applying) to control group and experimental group and the table shows that student score averages are converging as the average control group was (79.66). The average of the experimental group (78.97) and the Median gave the same value and the variation of the experimental group scores was greater than the control where it was (59.39) for the experimental and (28.33) for the control and the standard deviation of the experimental group (7.7) was greater than the standard deviation of the control group (5.32). This indicates that the differences between grades for the experimental group are greater than those for the control group.

Table (3) Shows the difference between the mean of the experimental and control group

Groups	Sample	Mean differences	Standard Deviation	Average error	T. test	Freedom degrees	Significance level
Experimental Control	39	0.6923	8.351	1.337	0.518	38	0.608

Table (3) shows the differences between the averages of the experimental and control groups for the post achievement test. The sample consisted of 39 students and the difference between the averages (0.69) with standard deviation (8.35) and the value of T (0.518) and the significance level (0.6) was greater (0.05), indicating that there were no significant differences between the experimental group and the control in the achievement level due to the use of the VLE. Therefore, we accept the statistical hypothesis that there are no significant differences.

RQ4:

- What is student satisfaction towards employing virtual learning environments through Blackboard in their university courses?

Which is expressed in the following statistical hypothesis: Students' satisfaction towards the employment of the VLE through Blackboard in their university courses is positive.

A questionnaire of 30 statements has been applied to measure student satisfaction towards the use of e-learning methods through VLE of Blackboard. Statistical analysis is shown in tables (4, 5) Statistical descriptive analysis of students' responses to questionnaire items consisting of (30) question, where average range between (1.12) and (1.2). The results showed a convergence in the standard deviation of the responses to each of the questionnaire items where the standard deviation ranged between (0.8) and (0.33) and the range between the two values (1, 2). The value of the Median was (2), and there was a difference in the students' responses ranging from (0.8) to (0.11).

Nonparametric statistical analysis was used to calculate the statistical significance of each of the 30 questionnaire items to measure students' satisfaction with the interaction through the VLE using the one-group kai square, where the group was consisted of (39) Students and expected repetition (13) for each test answer. Most of the questions showed significant differences in favor of the VLE, where the significant level was less than (0.05). This means that there are significant differences in favor of the VLE in (27) a question, the value of F was greater than (0.05) in question 13, 14 and 15 had, indicating that there are no statistically significant differences in these three questions.

6. Discussion:

In light of the previous findings and statistical analysis, the results showed that there were no significant differences between the achievement level of the experimental group and the control group; this may be because students who have studied in the traditional way have used all modern technological methods in teaching, from multi-media, such as

smartboard. Students' achievement was high because the traditional method was focused on achievement and the differences between students. This positively impacted on students' grades in cognitive-related achievement testing, but students lacked training in modern technology methods based on interaction through the Internet. The study was only for achievement without the application of synchronized and asymmetric interaction methods through the VLE, there is not enough interaction between students during study. This result is consistent with the study of: Alturise, (2020), Dwidienawati, & others (2020), Ncubukezi & Daramola (2020), and the study of Al-Amer 2020, which indicated that there were no statistically significant differences at the level of 0.05 in achievement test at the first cognitive level (Remembering) and the second level (Understanding). Significant differences were found at the third cognitive level (Application), according to Bloom's taxonomy.

But if this confirms that there are no significant differences, this means that the students of the experimental group have obtained the same grades in cognitive achievement. But they learned through face-to-face teaching with the application of modern interactive methods from virtual environments. This enriched the learning process, and this is what the results of the questionnaire show, and that means that learning through the VLE gives high outcomes in the cognitive aspect equal to what the face-to-face interaction with the instructor has achieved, as for the results achieved through statistical analysis using the Kai square of questionnaire items. The results showed statistical significance in 27 questionnaire questions, and this indicates that students were fully satisfied with learning through this new environment, Despite resistance and unconvincing at first, and just obsession with modern technology, Without minimal benefit but after training and application, students felt the importance of this method, and hoped that it would be applied in all the courses they study.

The obstacle they face was the lack of training in employment, Still, after training and overcoming difficulties for them, students showed a very positive reaction to this method and to all the interaction methods employed in the university's Blackboard system. However, this method relies on reducing the role of the instructor and focusing on the student and his interaction with his colleagues. This result is consistent with the study of: Al-Qahtani & Rajkhan 2020, Iffat Rahmatullah 2021, Syakur & Sabat 2020, Bessadok, Abouzinadah, & Rabie 2021.

7. Conclusion:

The results of this study imply that it was necessary to think about dependent variables that are more important than achievement, especially with the nature of learning outcomes of the communication skills course. Therefore, there is a need to conduct a similar study on other dependent variables, and in other courses, particularly science courses such as physics, chemistry, and mathematics.

We also recommend expanding the application of learning methods through the VLEs in universities, as they allow the student to rely on his own learning, to be responsible for his learning, to allow constant communication with the instructor and colleagues, whether through synchronous or asynchronous interaction. However, students must be adequately trained. As well as faculty members on how to interact with them so that full benefit is achieved because they support the student in his learning and conducting comparative research between interaction methods to identify the most effective in university education.

This study is limited to measuring the effect of virtual learning environments using the Blackboard on achievement and the level of students' satisfaction with studying using this method in the communication skills course.

Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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