Evaluation of using Google Classroom as a Tool for Asynchronous E-learning at Sebha University

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A B S T R A C T

Recently, technology is anywhere and everywhere, and education systems are affected by technology at a rapid pace, that increasingly advance the career of students as well as the teachers. The current worldwide trend is to learn online since the coronavirus pandemic outbreak, whereby E-learning is not optional rather it is mandatory. This study has been carried out to assess the effectiveness of E-Learning facility mainly Google Classroom at Sebha University. Five aspects of Google Classroom usage are measured including the perceived ease of use, the perceived usefulness, Communication and interaction, benefit, student satisfaction. A set of questionnaires have been distributed to a sample of 94 students in different bachelor and master subjects. The results shows that all the ratio of the five measured aspects where all above averages, which prove that majority of the students satisfy with the Google Classroom's tool that were introduced in the class.

تقييم استخدام قوقل الفصل الدراسي كأداة للتعليم الإلكتروني غير المتزامن في جامعة سبها

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الملخص

مؤخراً أصبحت التكنولوجيا في كل مكان، والتعليم قد تأثر بهذه التكنولوجيا بشكل متسارع وعلى كل الأصعدة، والذي بالضرورة أسهم في تطوير مهارات وقدرات الطلبة والأساتذة على حد سواء. التوجه العالمي اليوم نتيجة أزمة كورونا أصبح للبدائل المتاحة على شبكة المعلومات الدولية، حيث أصبح التعليم الإلكتروني ليس خيار بل هو الضامن الوحيد لاستمرار العملية التعليمية. هذه الدراسة تهدف إلى قياس مدى الاستفادة العملية و مدى تقبل الطلاب في جامعة سبها لنظام إدارة التعليم الإلكتروني الذي تقدمه شركة قوقل وهو قوقل الفصل الدراسي (Google Classroom). حيث وضعت خمسة معايير عامة للقياس لاختبار الفرضية التي بنيت عليها الدراسة وهي: سهولة الاستخدام، الاستفادة المرجوة، التواصل مع الأستاذ والطالب، التفاعل بين الأستاذ والطالب، وأخيراً مدى رضا الطالب، تخللت هذه المعايير أسئلة جزئية عديدة تخص كل معيار من هذه المعايير. لاختبار هذه الأسئلة تم تصميم استبانة وزعت على 94 طالب وطالبة في المرحلتين الجامعية والتخصصية لأربع كليات بالجامعة. النتائج بينت اعتماداً على الاستبانة التي صممت أن معدل الإجابة عن الاسئلة للخمس معايير المذكورة كان اجمالاً فوق المتوسط. والذي بيَن أن أغلب الطلبة الذين سبرت آرائهم راضين ومرتاحين لاستخدام قوقل الفصل الدراسي كأداة للتعليم الالكتروني في جامعة سبها.

Introduction

With the rapid growth of the internet and information technology over the last decade, the way of teaching in the Classroom has been changing by adopting technology in education, which can be defined as a process of communication and information from teachers to students that contains the information education. Adopting the technology in education is known as e-learning, which can have a positive influence on the learning process, and allow students to access educational curriculum outside of a traditional

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Classroom an unlimited number of times and may help students to grasp learning materials. Moreover; the integration of technologies into the education Classroom as a different and innovative pedagogical approach can *enhance* student's *engagement* to achieve the desired learning objectives [1, 2].

E-learning can be classified into two categories: synchronous E-learning and asynchronous E-learning. In the former, the time for lectures coincides with the presence of the teacher and the student in front of the computer screens. It is a real-time learning tool or virtual Classroom involves online studies through chat and videoconferencing. In the latter, the presence of the teacher and the student is not required at the same time, and it involves coursework delivered via web, email and message boards, obtained educational materials, and in this type of E-learning, the learning activates can be carried out even while the student is offline. The e-learning process can be implemented by the learning management system (LMS), which is a software application that can be used with little technical skill to deliver instruction to students at a distance in order to support teaching and learning activities [3-5].

The learning management system became widely available, and it can provide all the necessary tools required by the teachers and the students to complete the educational processes. Such as hosting multimedia educational content, managing user's system privileges, and follow-up of academic assignments [6]. There are many applications available that can be used in managing E-learning, including: Moodle, Blackboard, Edmodo, Schoology, Sakai, Chamilo, TalentLMS, easy class, and Google Classroom application [7]. Google Classroom is one of Google suite Apps for Education, which is a free and cloud-based tool that includes Gmail, Calendar, Hangouts, Drive, Docs, Sheets, Slides, forms, Google Classroom etc. These applications can be used and benefit to manage the educational process. The main benefit of using Google Classroom is that it's simple to use, the teachers can easily create and manage virtual Classrooms, which can help in saving time, keep classes organized, and improve communication with students, organize assignments quickly, provide feedback efficiently and it can encourage collaboration between students and teachers. A detailed description the features and the benefit of using Google Classroom can be found in [8].

Sebha university has recently adopted Google Classroom application as tool for implementing e-learning duo to the following: (i) Google educational applications are available to all universities with free license; (ii) unlimited free storage space on Google cloud available to users; (iii) the integration features between Google applications that can be used in the management of e-learning activities such as Google Drive, Calendar, Email, Meet, YouTube, Google Classroom, etc. As a result of this integration, these applications can be easily used and exploited. For example, the educational materials such as books, video, text files used in Google Classroom can be stored on the available Google cloud storage space; (iv) refer to the YouTube links can be easily and directly done via Google Classroom.; (v) Moreover; Google Hangouts Meet was integrated in Google Classroom which can be used to implement and manage the synchronous E-learning through chat and videoconferencing. Therefore, Google Classroom can be used as a tool for a synchronous and an asynchronous e-learning management system.

The purpose of this paper is to evaluate the use of Google Classroom as a tool for Asynchronous e-learning from the learners' perspective at Sebha University. Specific research questions were raised, namely: 1. What Google Classroom features benefit or hinder online teaching and learning? 2. How does the use of Google Classroom impact the quality of teaching and satisfaction with the use of Google Classroom in general?

Initially the paper starts with introduction while the rest of this paper is structured as follows. Section 2 reviews literature of prior studies, followed by the description of methodology used in this paper. Section 4 presents experimental results, discussions and implications of this study. Conclusions are drawn in Section 5.

Related work

Recently, Google Classroom has been widely used in higher education as a tool to support teaching and learning initiatives [9]. It is a free web-based learning management system, and it has many features that can prove useful for teaching and learning and managing classes online. Overview on Learning through Google Classroom can be found in [10]. Amadeu et al. [11] evaluated the usability and user satisfaction of Google Classroom based on a qualitative and quantitative approach, whereby they stated that: Google Classroom can be a great tool used in pedagogical practice as a supportive of the teaching and learning process. In [12] the authors explored the effectiveness of Google Classroom's learning activities for data mining class, their results showed that the overall students were satisfied with the use of Google Classroom, and the authors suggested that the integration of Google Classroom's tools into the teaching and learning of data mining courses will enhance the teaching and learning activities. authors in [13] assessed the impact of the using of Google Classroom as an E-Learning tool for assignments management, and they stated that: it is easy to keep track and assess the assignments submitted through Google Classroom compared with the traditional manual way of submission. In [14] authors assessed the efficacy and acceptability of utilizing Google Classroom for teaching and learning activities among the students, and they stated that using Google Classroom can improve effectiveness and efficiency of teaching and learning activities. Authors in [15] adopted the technology acceptance model to analyze the elements that can influence students acceptance of utilizing Google Classroom, and the outcomes of this study demonstrated that both the perceived ease of use and perceived usefulness positively influence the behavioral intention, which thus impact the genuine use of Google Classroom. Espinosa et al. [16] evaluated the functionality and effectiveness of Google Classroom to assess student's perception of it, and they recommended that Google Classroom can be adopted as tools for E-learning due the following reasons: (i) free licensed availability; (ii) it is useful in understandability, attractiveness, and operability; (iii) Collaborative and effective learning tool through assignments features, which can enhance student engagement. In [17] , the benefits and challenges of the adoption of Google Classroom from the learners' perspective was explored, and the results demonstrated that the benefits include, paperless communication, assistance of assignments, enhancing communication with students and efficient class management, and the challenges include *delayed feedback*, difficult to grasp, unreliable internet connections and lack of support. Based on the existing work listed above, Google Classroom can be utilized as an effective and attractive learning tool for assistance of students in the E- learning activities.

Research methodology

The study was conducted at Sebha University in Libya by the end of 2019. An online questionnaire survey was sent to all the students who have used the Google Classroom in their study from different faculties, departments and programs at Sebha University. The data for this study was gathered using Google Forms, whereby the online questionnaire was distributed to the students at the end of the semester after using Google Classroom. A total of 91 valid responses were received. Each student was required to respond based on a five-point Likert scale, where five represented (strongly agree), four point represented (agree), three point represented (neither agree nor disagree), two point represented (disagree) and one point represented (strongly disagree) for every question.

The questionnaire consists of two main parts. The first part aims to collect the students' demographic information and internet usage. The second part covered various aspects of Google Classroom usage including the perceived ease of use, the perceived usefulness, Communication and interaction, benefit, student satisfaction.

Moreover, the five level Likert type questions are further scaled down to three categories (positive feedback, negative feedback, neutral feedback). Whereby, the positive feedback is composed of highly agree and agree respondents' answers, and negative feedback is composed of highly disagree and disagree respondents' answers, and neutral feedback is composed of neutral respondent's answer. In such a way, the analysis of the result will become much easier to demonstrate and understand.

This study adopted the questionnaire suggested in [12], whereby it is reviewed by experts to ensure its suitability for the domain.

Considering their recommendations, some minor modifications were made involving paraphrasing, deleting items, rephrasing sentences, and renumbering items.

Result and discussion:

Demographic characteristics of respondents

The students who answered the questionnaire are enrolled in four faculties, these faculties were based on the main campus located in Sebha city (faculty of sciences, faculty of information technology, and faculty of engineering and mining), and one-off campus located in Brack, Al-Shate (faculty of engineering). Fig. 1 shows the distribution of students based on their faculties. Whereby most of the students who participate to answer the questionnaire are from the faculty of information technology, followed by faculty of science, then faculty of engineering sciences, and lastly faculty of engineering and mining, with percentages of 38%, 32%, 28%, and 2% respectively.
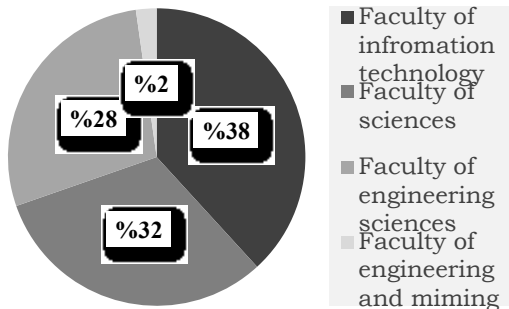

Figure 1: The distribution of students based on their faculties.

The proposed questionnaire was distributed among Sebha university students from two programs, bachelor and master of sciences (M.Sc.) students. Fig. 2 shows the distributions of students based on the two programs. Whereby, most of the students who answered the questionnaire are bachelor students with a percentage of 67, followed by M.Sc. student with 33%.
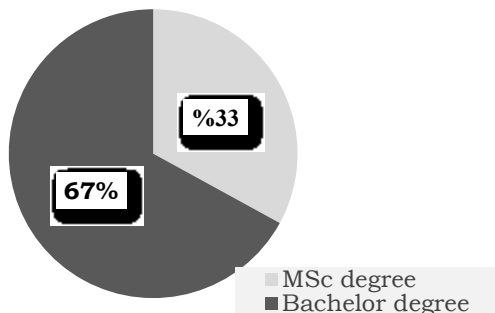
Figure 2: The distribution of students based on their program

Usage of Google Classroom

In order to identify the information and communication technology usage among the respondents, questions on average internet usage were used in the proposed questionnaire. Total of four questions based on five options Likert scale had been asked, these questions with the respondent's result are shown in Fig. 3. The highest percentage of the average internet usage among the respondents is several times a day with 65.6%, followed by several times a week with 20.4%, then once a day with 11.8%, and lastly once a week with 2.2%. This implies that the most of the respondents are familiar with the usage of web-based applications such as Google Classroom.
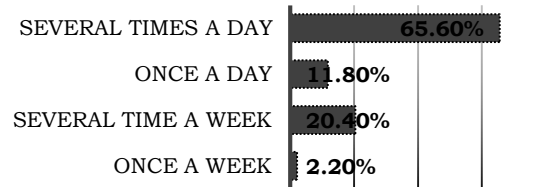
Figure 3: Percentage of average internet usage among the respondents

Based on Table 1, which shows respondent's answer to the easiness of access to Google Classroom services. The positive feedback column shows that all the respondent's answers are highly positive, which indicates that the Google Classroom is easy to access among the respondents. The lowest percentage based on positive feedback column is 62%, which goes to the component of 'Using Google Classroom does not require training'. Moreover, based on negative feedback column for the same question, the respondent percentage answer was almost 15%, this indicates that the Google Classroom needs training for some respondents. Therefore, the lecturers should pay more attention to training the students to use Google Classroom services. In contrast, the respondents strongly agreed that the introduction of Google Classroom in their class makes the process of submitting assignments easier with a percentage of almost 90%.

Table 1, Respondent's answer to the easiness of access to Google Classroom services

Question	Percentage		
	Positive feedback	Negative feedback	Neutral feedback
Signing in to the Google class	83.8%	2.1%	13.9%
Access to Google Classroom courses and materials	85.8%	3.2%	11.9%
Receiving Tasks and assignments in the Google Classroom	90.1%	5.4%	6.5%
Submitting the assignments in the Google Classroom	80.4%	6.5%	14.1%
Navigating the Google Classroom	86.9%	5.4%	8.6%
Understanding the Google Classroom is generally easy	74.1%	5.3%	20.4%
Using Google Classroom does not require training	62.9%	15.7%	25.8%
The Google Classroom interface is comfortable and user friendly	82.6%	5.4%	13%

Easy access to Google Classroom services

Table 2 shows respondent's answer to the benefit gained from using the Google Classroom. Based on the positive feedback columns, all

the respondents answer to the questions is almost 70% and above, which indicates that most respondents are strongly agreed to the component of the benefit gained from using the Google Classroom. Moreover, the highest percentage of 85% and above goes to the following three questions: the comments and feedback provided by the lecturer are helpful, and the Google Classroom contains useful and unique features, and the respondent is recommended using the Google Classroom in all other courses. In contrast the negative

feedback from respondents did not exceed the 8% in its worst cases, which emphasize the drown statement. However, two answers have a higher neutral percentage with more than 20%, which goes to the quality of the educational activity, and using Google Classroom increases my academic competence. This result indicates that the few of respondents disagreed that Google Classroom increases their academic competence.

Table 2, which shows respondent's answer to the benefit gained from using the Google Classroom

The benefit gained from using the Google Classroom

Question	Percentage		
	Positive feedback	Negative feed back	Neutral feedback
The quality of the educational activity	74.7	6.5	20.8
Excellent way to interact between the lecturer and the student, and students with each other	82.4	5.4	14.2
Helpful in submitting assignments on time	81.5	5.2	14.1
There is consistency between the use of the Google Classroom and the topics raised in the regular semester class in terms of content	78.8	5.5	18.8
Helpful in monitoring my performance (assignments grades)	82.6	7.6	10.8
Helpful in following up the topics being study and discussion	78	5.4	18.6
The comments and feedback provided by the lecturer are helpful	88	2.1	10.8
Using Google Classroom increases my academic competence	69.2	6.5	26.3
Using of Google Classroom enhances learning activity	82.7	3.2	13.9
Helpful in doing and achieve the assignments fast	79.5	4.3	16.1
The Google Classroom contains useful and unique features	85.7	6.5	9.8
I recommend using the Google Classroom in all other courses	88.7	7.8	7.8

Based on Table 3, which shows respondent's answer to the communication and interaction across the Classroom from Google. Based on the positive feedback columns, only two of respondents answer to the questions are highly positive with more than 80%, which goes: I am comfortable using the class as a way to communicate, and the lecturers are enthusiastic in teaching and using the Google Classroom. This indicates that only few of the respondents agreed to the component of the communication and interaction across the Classroom from Google. Moreover, from the negative feedback column we can see that the highest percentage is 13% goes to: there is no problem in interacting and communicating

with other students in the Classroom, whereby some of the respondents have difficulties interacting with their colleagues. From the neutral column one can conclude that some of the respondents have problems in contacting both the lectures and other colleagues with high percentage goes to: There is no problem in interacting and communicating with other students in the Classroom and the lecturer helped the students to participate and enrich the discussion. Therefore, lecturer should put more concern on making interactive platforms of online learning in order to have an active online learning.

Table 3, respondent's answer to the communication and interaction across the Classroom from Google

Communication and interaction across the Classroom from Google

Question	Percentage		
	Positive feedback	Negative feedback	Neutral feedback
I am comfortable using the class as a way to communicate	81.3	2.1	18.6
The lecturer helped the students to participate and enrich the discussion	67.3	6.5	27.1
There is no problem in interacting and communicating with other students in the Classroom	53.8	13.1	35.1
The lecturers are enthusiastic in teaching and using the Google Classroom	83.6	4.3	13
The lecturers can be contacted easily through the Google Classroom	75	6.5	19.5

Based on Table 4, it's clearly shown from the positive feedback column that all the respondents' answers are highly positive with lowest percentage of almost 75%, and highest of almost 95%. This indicate that all respondents are strongly agree to the interaction between lecturers and student using Google Classroom. However its worth to mention that the highest respondent's negative feedback almost 11%, which goes to: the lecturer's responses are helpful and helped me understand the scientific topics in the course, which need more attentions from the lectures to enhance the way they respond to the students to understand the scientific topic introduced to them.

Table 4, respondent's answer to the interaction between lecturers and student using Google Classroom

Interaction between lecturers and student using Google Classroom			
	Percentage		
Question	Positive feedback	Negative feedback	Neutral feedback
The lecturers provided clear information about the use of the Google Classroom	84,4	8.8	10
The lecturers explained the important dates for the submission of the tasks and the required learning activities	94.5	4.3	3.2
The teaching material was provided by the lecturers through the Google Classroom	86	4.3	9.6
The assignments were clarified by the lecturers through the Google Classroom	89.2	1	9.6
The lecturer's responses are helpful and helped me understand the scientific topics in the course	74.1	10.7	15
Clear information and instructions are given by lecturers on how to participate in the Google Classroom and interact with learning activities	83.8	7.5	8.6

Based on the Table 5, the positive feedback column shows that most of the respondents answer to all questions is above 70%, this indicates that all the respondents strongly satisfied with using Google Classroom as a tool for learning and they recommend it to be applied to other courses. Moreover, the negative feedback is low for all questions, which emphases the stated statement. From the neutral column there are some questions with higher percentages which are: Using Google Classroom is fun compared to traditional Classrooms, and the chances of passing the course is increasing by using the Google Classroom, with 24% and 23.9% respectively.

Table 5, respondent's answer to the student's satisfaction with the use of the Google Classroom

Student's Satisfaction with the use of the Google Classroom			
	Average		
Question	Positive feedback	Negative feedback	Neutral feedback
Using the Google Classroom saved a lot of effort, money and time in printing and photographing learning materials	76.9	6.5	18,6
I can get help from others when I have difficulties while using the Google Classroom	89	5.4	7.6
I prefer to use the Google Classroom as an education and motivation tool	72.8	6.5	21.7
Using the Google Classroom helps me understand the course	89.1	5.4	6.5
The chances of passing the course is increasing by using the Google Classroom	68.4	8.6	23.9
Using of Google Classroom is fun compared to traditional Classrooms	69.2	8.7	24.1
The Google Classroom will be my first choice in e-learning activities	80	6.6	16.6
I recommend other students to use the Google Classroom	79.3	3.2	18.4
I recommend the Google Classroom to be applied in all university courses	84.9	3.2	11.8

Conclusions:
In this study, we measure the overall student's satisfaction with Google Classroom, the results clearly show that Google Classroom is effective as an active learning tool. The result reveals that more attention from the university should be put to train the students to engage successfully in the usage of Google Classroom. Moreover, the study recommends that Google Classroom should be integrated into the teaching and learning of all classes in graduate and post graduate programs. Implementing integrated learning through Google Classroom can enhance the teaching and learning environments and students' ability.

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