The Effect of Cloud Computing Program on Developing Technical Terminology in English for First Year Applied Arts Students

أثر إستخدام تطبيقات الحوسبة السحابية في تنمية المصطلحات الفنية باللغة الإنجليزية لطلاب الفرقة الأولى بالمعهد العالي للفنون التطبيقية

Dr. Yasmin Mohamed Ahmed Ibrahim

Lecturer of Curriculum and (EFL) Instruction at Faculty of Education, Helwan University

Abstract

The main purpose of this research was investigating the effect of Cloud Computing program on developing technical terminology in English for first year Applied Arts students (n=100). Students of 1st year of The Higher Institute of Applied Arts at New Cairo Academy specialized in Interior Design and Marketing were participated and assigned to two experimental groups and two control groups. Two pre-post technical terminology tests were administered to both the experimental and control groups. When statistical analysis was performed, it was found that significant differences existed between the mean scores of the experimental groups on the pre and post administration of the tests. Moreover, it was found that using a cloud computing program was effective in developing technical terminology of the experimental groups. It was concluded that using the cloud computing applications proved to have a large effect size on developing technical terminology. Based on these results, it was recommended that: (1) technical terminology should be given more attention through a checklist that is derived from the needs analysis. It is designed to assist students to become more motivated and to increase students' positive attitudes to learn English language that is relevant to their specializations. (2) Using effective teaching methods is recommended to meet students' needs and desires to learn English. (3) More time and effort should be devoted to develop technical terminology.

Key Words: Cloud Computing Program, Technical Terminology, Applied Arts Students.

ملخص البحث

يهدف البحث الي قياس أثربرنامج الحوسبة السحابية في تنمية المصطلحات الفنية باللغة الانجليزية لطلاب المعهد العالي للفنون التطبيقية . تم تطبيق إختبار قبلي علي عينة البحث(١٠٠) ثم قسمت الي مجموعتين تجريبيتين(٥٠) ومجموعتين ضابطتين(٥٠) . أستمر تطبيق التجربة لمدة ثلاثة أشهر . بعد إنتهاء التجربة تم تطبيق الإختبار علي المجموعات الأربعة بعديا . و تم إجراء المعالجة الإحصائية الملائمة والتي كشفت عن وجود فروق ذات دلالة إحصائية بين متوسطات درجات المجموعتين التجريبيتين و المجموعتين الضابطتين في التطبيق البعدي لإختبار المصطلحات الفنية ، لصالح المجموعتين التجريبيتين. كما وجد فرق ذو دلالة إحصائية بين متوسطي درجات طلاب المجموعتين التجريبيتين في التطبيقين القبلي و البعدي ، لصالح التطبيق البعدى.كما أثبتت النتائج أن إستخدام برنامج الحوسبة السحابية و تطبيقاته أدت إلى تنمية المصطلحات الفنية للفنون التطبيقية لدى طلاب المجموعتين التجريبيتين، و أن لإستخدام برنامج الحوسبة السحابية حجم تأثير كبير في تنمية المصطلحات الفنية للفنون التطبيقية. و بناء على النتائج أوصى البحث ما يلي: ضرورة الأهتمام بحاجات طلاب الفنون التطبيقية من المصطلحات المستخدمة في التخصصات المختلفة من خلال قائمة الإحتياجات و كذلك الأهتمام بإستخدام طرق تدريس فعالة لتناسب إحتياجات الطلاب من اللغة الإنجليزية.

الكلمات المفتاحية : برنامج الحوسبة السحابة – المصطلحات الفنية – الفنون التطبيقية

1. Introduction:

Using English as the language of global communication has constantly increased. The number of English language users is also growing with the presence of technological innovations, knowledge, flow of satellites, the internet, and digital communication in all its forms and users. This led to the expansion of the English language teaching not only for public purposes, but also for specialized purposes to suit the needs of learners.

According to Bell (2012) and Harding (2017) the existed English courses did not meet the needs of learners. Those courses focused on English only as a school subject; totally contrary to what is required in the teaching of English. According to the flow of knowledge and information, there has been a growing demand for the presence of English language courses that meet the special needs of a particular course or a particular course or career. This is called English for specific purposes (ESP).

Teaching English for specific purposes (ESP) is different from teaching English for general purposes. ESP is not just a branch of language or a certain set of rules and concepts; but it focuses on the skills and certain principles relevant to a certain specialization. It is also not just a necessity on the existence of a new teaching method of language; but it is related to a new direction to determine the content taught for a certain group of people. (Anthony, 2020)

Chen (2016) suggested that we cannot teach students all what is related to English, but we can teach the most important points in certain periods to enable them to purposefully adapt with life and certain professional situations according to the needs of the English language in their specialists, dealing with these situations.

Hence, it is important for teachers to vary the teaching methods while teaching terminology for their students to suit the preferences, needs, and desires of the students and the content being taught linking it all to the real world and the needs of the labour market and job requirements.

Nowadays, millions of people want to improve their command of English. They can learn English through formal teaching, travel, and research abroad and through the media and the internet. The English has established a growing wish for effective language teaching and world's need for language teaching materials and resources. English Learners must have full command of English to a high level of accuracy and fluency. Therefore, there is an increasing need for an effective teaching methodology.

Using emerging technology to support teaching and learning in universities has clearly changed the educational schemes being conducted in many countries. Thanks to technology, educational institutions can cooperate, connect, share resources, and enlarge registration. Many online certificate and degree programs are commonly offered in many universities throughout the world. Worldwide institutions of education have become extremely dependent on new technology for teaching, learning and for conducting research. They search for chances to rationalize their

resources management. With the introduction of Cloud Computing program, these chances have become better. Many universities in the developed countries have recognized the possibility and ability of using Cloud Computing program in higher education.

The Cloud Computing program is based on a number of modern technologies, such as Internet, virtualization, grid computing, and web services. It is just using resources of computing on the Internet rather than on computers. According to Reese (2009), Cloud Computing, like the web, is the evolution of assortment of technologies that have come together over the past decade or more to change approach of the organization for building infrastructure of information technology and hosting systems of information. Cloud Computing program includes a network computing, where a program or application can run simultaneously on different computers. It specifically indicates to a computer hardware machine or computer hardware machine group commonly pointed to as a server via a network of communication like the Internet, intranet, local area connection network (LAN) or wide area network (WAN).

Any user who has permission to access the server may use the processing power of server for running an application, data storage, or executing any task of computer. Thus, rather than using of the personal computer every-time to run the application, the user can use the application from anywhere in the worldwide as the server supplies the application with the processing power. The server is also connected to a network via the Internet or other connection platforms to be accessed anywhere.

On the computer, documents have been created and stored. The documents are not accessible only on their own network, but computers outside the network could access them. The software programs are not being run from one's personal computer within the Cloud Computing environment, but rather are stored on Internet-accessed servers. According to Ajith & Hemalatha (2019), the Cloud Computing program provides Information Technology resources and capabilities such as: applications, storages, communication, collaboration, and infrastructure through Cloud Service Provider

services. Also, they pointed that Cloud Computing has different features such as shared infrastructure, self-service, pay-per use model, being dynamic, virtual, elastic and scalable. They used Cloud Computing program as they believed that all students and staff who need much cooperation and data security would benefit from Cloud Computing in an academic environment.

To conclude, Cloud Computing program seems promising in enhancing teaching practices with all capabilities and features.

2. Context of the problem:

The researcher's feeling of the weakness of technical terminology for 1st year Applied Arts' students; Interior Design and Marketing Specialization, at the Higher Institute of Applied Arts was emphasized through the following:

1) Students' results in the preparatory year English course exam:

- Revising the students' results in the preparatory year English course exam, in which technical terminologies are supposed to be used, and finding out that 73% of the students got low marks.

2) Classroom observation:

The researcher as a lecturer at the Faculty of Education, Helwan University was mandated at the higher institute of applied arts -New Cairo Academy, to teach English courses for the 1st year, Interior Design and Marketing specialization and observed the following:

1- The courses available hardly provide individualized activities which address the students' needs.
2- Students are exposed to inconsistent teaching methods and have a poor vision about technical terminology.
3- Students are not allowed to express their feelings and emotions freely.

4- The conventional strategies used for teaching which are mainly based on memorization, lead to students' poverty in technical terminologies.
5- Students do not have the sufficient opportunities to practice the technical terminology freely in the classroom.
6- Even if there are strategies implemented in teaching technical terminology, they are not based on the students' prior knowledge.

a) A Pilot Research:

1- Interviews:

- **Interviews with students:**

The researcher has conducted some unstructured interviews with the students and the results showed the percentage of students who do not realize the importance of technical terminology and its impact on their careers and therefore do not give it the proper attention amounted to about 39% of the total number of the interviewed students. Moreover, the percentage of the students who realise the importance of technical terminology but find great difficulty in understanding, researching, and applying it amounted to 45%. While the reminder16% recognize the importance of technical terminology and do not face any difficulty in researching it.

The students' lack of knowledge and attention concerning technical terminology, from their perspectives, is due to the following reasons:

- **Time Inadequacy:**

The new technical terminology taught in the English courses which require considerable training and application in the classroom to enable the students of mastering them, which does not usually happen because of time inadequacy as most of the class time is allotted to theoretical explanation.

- **The regular method of instruction:**

Which focus on the theoretical explanation without giving the opportunity for application.

- **Individual differences among students:**
While a student can understand a technical terminology only through the theoretical explanation and a one-time application, another may need to see the same technical terminology applied several times and get several examples before mastering it.

- **Interviews with ESP Teachers of NCA:**
ESP teachers may find difficulty in teaching specific terms related to specific fields. So, they teach them through giving out their meanings in the students' mother tongue and putting them in a list directly without restoring to any teaching method that might be effective in helping the students to understand the meanings of the terms. Sometimes, these terms are taught by establishing a list of terms and their definitions for the students to research by heart and write in the exam. (a short- goal without real benefit); this is contrary to any ESP course objectives that target the students' real understanding and use of the learned terms, which will lead to expanding the students' knowledge, expanding their minds, and fulfilling their academic and professional needs in the future (areal long-term goal).

2- Previous Studies:

Many studies and researches dealt with teaching English for specific purposes (technological , administrative …… or others) by professors at the university stage, faced a lot of problems in the selection of appropriate methods to teach students because of the English teachers' lack of appropriate background about the students' specialization as the teachers' research focused on linguistic studies or literature (general English), not practical studies related to the students' technical specialization. As a result, most of the teachers teach those courses, but they are usually

dissatisfied with their performance. This leads to using traditional teaching method in addressing the specific topics,(Abdul Ghani, 2019) and having difficulty in giving concrete examples in the area of specialization to clarify the meanings of terms and developing them.(Chung and Nations, 2013).

3- Questionnaires:

The researcher administered two questionnaires to identify students' needs of English language in general and for specific purposes (Technical Terminology) in particular. The responses have yielded the following results:

- **English is given the least importance** compared to other subjects while the students see it more essential for them.
- **Failure to meet the students' needs from the English language** in relation to their specializations.
- **English language proficiency is not connected with its usage** as students focus on memorizing technical terminology for getting good marks in exams(a short-term goal) not for using it in the future (a long-term goal).
- **The regular methods of instruction used**, are not interesting as they lack diversity and they do not meet the students' needs.

4- Tests:

The researcher noticed the students' low scores when researching technical terminology in English for specific purposes' courses such as: Art Deco, Case goods, Chair rail, and Faux….etc.). There is also an overlap in understanding the terms which are later used in job interviews, training period and field work.

Hence, the researcher started to think of a way that provides adequate time for the teacher to explain the technical terminology and to give illustrative examples that students need to master. The difficulty lied in finding a way that helps the teacher and students as well. So, she reviewed related literature and previous studies thoroughly.

She found out that using Cloud Computing program was highly recommended to overcome similar problems.

3- Statement of the Problem:

The researcher noticed that 1st year students at Higher Institute of Applied Arts- New Cairo Academy are weak in technical terminology which is necessary for them as a requirement for their academic levels. So, the present research attempted to develop technical terminology for 1st year students through using Cloud Computing Program.

4- Research Questions:

1- What are the needs of First year Applied Arts student concerning technical terminology?

Out of the first main question, the following 2 sub-questions were derived:

1-(a) what are the needs of student specialized in interior design concerning the interior design technical terminology?

1-(b) what are the needs of student specialized in Marketing concerning the marketing technical terminology?

2- What is the effect of using Cloud Computing Program on developing technical terminology for First year Applied Arts Students?

Out of the Second main question, the following 2 sub-questions were derived:

2-(a) what is the effect of using Cloud Computing Program on developing technical terminology for First year Applied Arts Students specialized in Interior Design?

2-(b) what is the effect of using Cloud Computing Program on developing technical terminology for First year Applied Arts Students specialized in Marketing?

5- Research Hypotheses:

1- There are statistically significant differences between the mean scores of the experimental groups and those of the control groups in the post administration of the technical terminology test, in favour of the experimental groups.

In order to test this first main hypothesis, the following 2 sub-hypotheses were set:

1-(a) There is a statistically significant difference between the mean scores of the experimental group (a) and the control group (a) of Interior Design Specialization in the post- administration of the technical terminology test, in favour of the experimental group.

1-(b) There is a statistically significant difference between the mean scores of the experimental group (b) and the control group (b) of Marketing Specialization in the post- administration of the technical terminology test, in favour of the experimental group.

2- There are statistically significant differences between the mean scores of the experimental groups in the pre and post administration of the technical terminology test, in favour of the post- administrations.
In order to test this first main hypothesis, the following 2 sub-hypotheses were set:

2-(a) There is a statistically significant difference between the mean scores of the experimental group (a) of Interior Design Specialization in the pre and post administration of the technical terminology test, in favour of the post- administration.

2-(b) There is a statistically significant difference between the mean scores of the experimental group (b) of Marketing Specialization in the pre and post administration of the technical terminology test, in favour of the post- administration.

6- Aim of the Research:

The present research aimed at determining the effect of using Cloud Computing Program on developing technical terminology for first year Applied Arts students specialized in: a) Interior Design and b) Marketing Specializations.

7- Research Significance:

1- Drawing the attention of those who are interested in teaching English for academic purposes to the importance of using suitable teaching methods to teach technical terminology to get rid of the existed short comings.
2- Drawing the attention of those who are involved in the teaching of technical terminology to the importance of using cloud computing program to meet the needs of Applied Arts' students.
3- Identifying a list of the important key terms of Applied Arts in English Language.
4- The possibility of applying the results of this research on other colleges and universities specialized in Applied Arts.

8- Research Delimitations:

The present research was delimited to:

1- Teaching the technical terminology, which is studied by first year Applied Arts students in two different specializations: Interior Design and Marketing", during the first semester in the academic year 2020/2021.
2- The research sample was selected randomly from first year students, (Interior Design and Marketing Sections), Faculty of Applied Arts, New Cairo Academy.

9- Definition of Terms:

- **Technical Terminology:**

It is the terminology through which the experts communicate precisely and concisely. In international relations, specialized conferences of arts, exhibitions, and the more refined organizational systems that contribute daily to the apparition of new specialized technical terms and within this general label of technical language, there are a lot of specialized Interior Design, Marketing, Photographing, Advertisement, and Decoration. (Boarcas,2019).

In this research technical terminology is defined operationally as the main concept to the term in addition to the very specific particular context.

- **Cloud Computing program:**

The most recent and accepted standardized definition of Cloud Computing is the one by the National Institute of Standards and Technology (NIST), (2021): "Cloud computing is a model for enabling ubiquitous, convenient, on demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models" (p.6).

Cloud computing program is operationally defined in the present research as the use of various services, such as software development platforms, servers, storage, and software, via the Internet." Cloud computing is a kind of computing that is based not on local servers or personal devices to handle applications but on sharing computing resources.

10- Theoretical Background:

A- Developing Technical Terminology:

Growth of English for Specific Purposes (ESP)

From the early 1960's, English for specific purposes (ESP) has grown to become one of the most prominent areas of English as a foreign language (EFL) teaching. Today, its development is reflected in the increasing number of universities offering an MA in ESP (e.g. The University of Birmingham, and Aston University in the UK) and in the number of ESP courses offered to overseas students in English speaking countries. There is now a well-established international journal dedicated to ESP discussion, " English for specific purposes: An International", and the English for specific purposes Special Interest Groups (ESP SIGs) of the International Association of

Teachers of English as a Foreign Language (IATEFL) and Teachers of English to Speakers of other languages (TESOL) are always active at their national conferences.

Definition of ESP:

ESP has been referred to as applied English Language Teaching (ELT) as the content and aims of any course are determined by the needs of a specific group of learners. ESP is often divided into English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). Further sub-divisions of EOP are sometimes made into business English, English for Professional Purposes (EPP), e.g. English for doctors, lawyers), and English for Vocational Purposes (EVP) , e.eg. English for tourism, nursing, Arts, and Aviation)

The Importance of ESP:

With the spread of globalization, there has been an increase in vocational training and learning throughout the world, due to the increasing use of English as the language of international communication. More and more people are using English in a growing number of occupational contexts. Students are starting learning and therefore mastering general English at a younger age and so they move on to ESP at an earlier age too.

ESP and EGP (English for General Purposes)

One may ask " What is the difference between ESP and English for general purposes (EGP) approach?" the answer for this quite simply, " in theory nothing, in practice a great deal". At the time, teachers of general English courses, while acknowledging that students had a specific purpose for researching English , would rarely conduct a needs analysis to find out what was necessary to actually achieve it. Teachers nowadays are much more aware of the importance of needs analysis, and certainly materials writers think very carefully about the goals of learners at all stages of materials production. Perhaps this demonstrates the influence that the ESP Approach has had on English teaching in general. Clearly the line

between where General English courses stop and ESP courses start has become very vague indeed. (Anthony, 2020)

Technical Terminology:

As the dictionary puts it (Collins English Dictionary on-line), terminology refers to the body of specialized words related to a particular subject, the research of terms, that is, the system of terms belonging or peculiar to a science, art, business or specialized subject; Teaching English for specific purpose. Thus, technical terminology refers to the specialized vocabulary characterizing a profession, or some other activities to which a group of people dedicate significant parts of their lives, or sometimes even a slice of an industry. Specialists of a certain area need a specialized vocabulary to properly communicate about notions and concepts specific to their field and that is the technical terminology characterizing their area.

In other words terminology was the result of the need of experts to communicate precisely and concisely; this sometimes had the undesired effect of excluding those unfamiliar with the specific language of a certain group as these revolutionary changes touch all the people coming from different cultural, educational background. This may produce difficulties and misunderstandings. Difficulties may also come up when experts belonging to different area of activity that are still connected, use different terms to denote the same phenomena and processes. To conclude, it is vocabulary, the living body of a language that registers the most dramatic and is the technical terminology or characteristic idiom of a special activity or group. (Webster Online. Retrieved 29 November 2020)

The importance of Technical Terminology is clear when terms are included in meaningful sentences. This increases the students' ability to construct meaning of what they need. This makes it easier for

students to respond and interact with each other in meaningful contexts.

The three principles for teachers who teach Technical Terminology:

Bell (2012) advocated three principles for teachers to improve their knowledge and skills in a particular area of Technical Terminology:

- **Curiosity:**
  The teacher should be interested in the subject area and want to learn more.
- **Collaboration:**
  Teachers should seek one subject specialists, show them their work and ask for their feedback.

- **Confidence:**
  Confidence will grow as teachers explore the new subject matter, engage with subject specialists and learn from their learners.

The Role of the teacher in Technical Terminology Teaching:

Boarcas (2019:61) stated that English teachers change to Technical English Field for some purposes:

- First, it provides a chance to work with highly motivated learners who are often disciplined, intelligent, and dynamic.

- Second, it involves more than simply teaching language. In technical English, there are highly specific goals and objectives which demand a tight control of the course plan and careful selection of materials and activities.

- Third, technical English may encompass professional skills as well as general language skills. Those skills are taught in the context of a varied subject matter.

- Technical English involves a certain amount of specific terminology, and this is often frightening at first. Reading books, and articles help the new teacher to become familiar with some of the terminology and special expressions used in technical English.

- A good technical English dictionary can also be very helpful. if a learner asked a question about a specialized term the teacher does not know, the first thing he or she can do is to look up the available dictionaries. The most important thing is not to panic if there are some strange or difficult words: the teachers' role is to help the learner acquire knowledge, not to provide all the answers.

Teachers should play many roles in teaching technical terminology. The teacher may be asked to organize courses, to set learning objectives, to establish a positive learning environment in the classroom, and to evaluate students' progress. This teacher's role was confirmed by Fiorito (2020) as follows:

- **Organizing Courses:**

The teacher has to set learning goals and then transform them into an instructional program with the timing of activities. One of the main tasks will be selecting, designing and organizing course materials, supporting the students in their efforts, and providing them with feedback on their progress.

- **Setting Goals and Objectives:**

The teacher arranges the conditions for learning in the classroom and set long-term goals and short-term objectives for students'

achievement. Knowledge of students' potential is central in designing a syllabus with realistic goals that takes into account the students' concern in the learning situation.

- **Creating learning environment:**

The skills for communication and meditation create the classroom atmosphere. Students acquire language when they have opportunities to use the language in interaction with other speakers. The teacher may be the only English speaking person available to the students, and although time with any of them is limited, the teacher can structure effective communication skills in the classroom. In order to do so, in the interactions with students, teacher tries to listen carefully to what they are saying and give understanding or misunderstanding back at them through some replies.

- **Evaluating Students:**

The teacher is a resource that helps students identify their language learning problems and find solutions to them, find out the skills they need to focus on, and take responsibility for making choices which determine what and how to learn. Teacher serves as a source of information to the students about how they are progressing in their language learning.

The Role of the learner in Technical Terminology Learning:

In a trial of defining the learners' role also, it has been claimed that the learners come to the class with a specific interest for learning, subject matter knowledge, and well- built adult learning strategies. They are in charge of developing English language skills to reflect their native- language knowledge and skills. (Fiorito,2020)

- **Interest for Learning:**

People learn languages when they have opportunities to understand and work with language in a context that they comprehend and find interesting. In this view, technical terminology is a powerful means

for such opportunities. Students will acquire English as they work with materials which they find interesting and relevant and which they can use in their professional work or further studies. The more learners pay attention to the meaning of the language they hear or read, the more they are successful; the more they have to focus on the linguistic input or isolated language structures, the less they are motivated to attend their classes.

- **Subject-Content Knowledge:**

Learners in technical classes are generally aware of the purposes for which they will need to use English. Having already oriented their education toward a specific field, they see their English training as complementing this orientation. Knowledge of the subject area enables the students to identify a real context for the vocabulary and structures of the technical classroom. In such way, the learners can take advantage of what they already know about the subject matter to learn English.

- **Learning Strategies:**

Adults should work harder than children in order to learn a new language, but the learning skills they bring to the task permit them to learn faster and more efficiently. The skills they have already developed in using their native languages will make learning English easier. Although you will be working with students whose English will probably be quite limited, the language learning abilities of the adult in the technical classroom are potentially immense. Educated adults are continually learning new language behavior in their native languages, since language learning continues naturally throughout our lives. They are constantly expanding technical terminology, becoming more fluent in their fields and adjusting their linguistic behavior to new situations or new roles.

Related Studies to Technical Terminology:

Berry (2018) assessed the effect of choosing and using terminology for EFL Classrooms. The sample of the research was 49

secondary English teachers and 22 tertiary teachers. Data was collected through a comparative research of the types and usage of the terms in specific purposes at the university level. This research discussed the use of grammatical terminology in English language teaching. The research attempted to help teachers understand the role and nature of terminology. Findings of the research showed that teachers were better equipped to make well-informed decisions about the terms they chose to use in the classroom.

The present research gained benefit from the display of the features and main principles in technical terminology teaching in EFL classrooms and how to apply them in this research. So, the researcher used them in helping the undergraduates of her research to understand the terms and use them in their researching, training, and future jobs.

Fu (2019) conducted a research to investigate the effect of learning styles, teaching styles and vocabulary teaching strategies in Chinese primary school. This research was carried out with three main aims: firstly, to investigate the present state of English vocabulary learning styles and teaching styles at primary school in China ; secondly, to investigate the strategies of English vocabulary teaching used by teachers in primary schools ; thirdly, to make suggestions for improvement and an attempt to put forward several practical vocabulary teaching strategies to meet the needs of different learning styles, which might reduce teaching and learning style conflicts. The participants in this research consisted of 253 EFL pupils and 21 EFL teachers of those pupils at the same primary school in the south of China. The survey was mailed to the primary school in China. Of the 203 participants, 21 teachers and 182 pupils returned the questionnaires. Descriptive statistics were calculated for the questionnaire data. Analysis of variance was used to compare learning styles and teaching styles. The results of this research suggested the multisensory approach might offer some benefits to meet diverse learners' needs.

This research was useful to the researcher of this research as it attracted her attention to the importance of using surveys and questionnaires for collecting data about the students' needs before using the formal techniques.

B- Cloud Computing

The Cloud Computing technology enables users to transfer services provided by a site to the Internet cloud. In other words, it allows applications and databases of a data-center to be transferred to an Internet sub-network. This activity is supported by companies specialized in handling data-center services, transferring data to their own data-centers, strategically positioned on the Internet. There are large organizations such as IBM, SUN, Microsoft, Accenture, EDS, Google, which examine the best location for specific installations, manage performance through demand analysis and are responsible for the data integrity. Ultimately, all the physical structure (hardware) as well as the logical structure (systems data) can be replaced through a Cloud computing transfer (Kim, 2020).

According to Paechter and Maier (2020), Cloud Computing classroom means using of information and communications technology in systematic teaching and learning. Cloud Computing has emerged as a trend in the 21st century. Nowadays, the term cloud computing has become important in the world of Information Technology. It is a kind of computing which is highly scalable and use virtualized resources that can be shared by the users. Users do not need any background knowledge of the services. An internet user can communicate with many servers at the same time and these servers exchange information among themselves (Hayes, 2020; Creeger, 2019 & Armbrust, et al., 2019).

Cloud Computing has been defined from various perspectives. Wang and Chen (2017) defined it as a model that enables convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be quickly provisioned and released with

minimal management effort or service. A cloud is a sort of parallel and distributed system which consists of a series of interconnected and virtualized computers that are dynamically provisioned and introduced as one or more unified computing resources depend on service-level agreements established through negotiation between the service provider and consumers (Chauhan 2020).

Types of Cloud Computing

According to Sultan (2019) and Gupta, Seetharaman and Raj (2021), Clouds can also be categorized based on the underlying infrastructure deployment model as Public, Private, Community, or Hybrid clouds. They are distinguished by their architecture, the location of the data center where the cloud is realized, and the needs of the cloud provider's customers.

Public Clouds

A cloud service provider owns the public cloud's physical infrastructure. Such a cloud operates applications from different customers who share this infrastructure and pay for their resource utilization on a utility computing basis. General Public Cloud is available to any internet user at any time.

Private Clouds

A pure private cloud is designed for the exclusive use of one customer, who owns and controls the cloud. Additionally, there are different types of clouds in terms of ownership and operation. The fact that the cloud is used by a specific customer is the remarkable feature of any private cloud (Gupta, Seetharaman & Raj, 2021).

A customer might own a private cloud; however, the cloud can be built, installed, and managed by a third party rather than the customer. The physical servers might be situated at the customer's premises or sited in a collocation facility. Another alternative to a private cloud is a virtual private cloud has been recently introduced. This means that a customer is private cloud has been recently introduced. This means that a customer is allocated a private cloud inside the physical infrastructure of a public cloud (Gupta, Seetharaman & Raj, 2021).

Community Clouds

Several customers who share similar requirements can share an infrastructure and might share the configuration and management of the cloud. They might do this management by themselves or by another third party.

Hybrid Clouds

Finally, any composition of clouds, whether private or public, could constitute a hybrid cloud and be managed by a single entity, provided that there is enough commonality between the standards used by the constituent clouds (Shayan, Azarnik, Chuprat, Karamizadeh & Alizadeh, 2019).

Models of Cloud Computing

Cloud Computing is a model that enables ubiquitous, appropriate, on demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. The three types of cloud models are Infrastructure-as-a-Service, Platform-as-a-Service, and Software-as-a- Service. Their basic functions can be summarized in the phrases 'Host', 'Build', and 'Consume'. Each offers a different level of flexibility and control over the product that your business is 'buying'. Each also varies in its relationship to your existing IT infrastructure. Because of the wide variances between the three, it is important to determine which model will suit your business's needs the best. (Mell & Grance, 2021).

Software as a Service (SaaS)

In this service, the consumer uses the provider’s applications running on a cloud infrastructure 2. The applications can be accessed from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not direct or control the underlying cloud infrastructure, such as network, servers, operating systems, storage, or even individual application abilities, with the possible exception of

limited user-specific application configuration settings (PARANET, 2017).

Platform as a Service (PaaS)

In this service, the consumer can deploy onto the cloud infrastructure consumer-created or acquired applications designed using programming languages, libraries, services, and tools supported by the provider.3 The consumer does not direct or control the underlying cloud infrastructure, such as network, servers, operating systems, or storage, but can control the deployed applications and possibly configuration settings for the application-hosting environment. Gillam, Cooke and Skinner (2019) mentioned some examples of key PaaS. These are Google App Engine, Microsoft's Azure, and Force.com.

Infrastructure as a Service (IaaS)

The consumer is given the ability to provision processing, storage, networks, and other fundamental computing resources where the consumer can use and run arbitrary software, which contains operating systems and applications. The consumer does not direct or control the underlying cloud infrastructure. However, he/she has control over operating systems, storage, and deployed applications; and possibly limited control to select some networking components (e.g., host firewalls) (Gillam, Li, & some networking components (e.g., host firewalls) (Gillam, Li, & O'Loughlin, 2012).

The Implication of Cloud Computing Technology in Education and in English Classroom Settings:

Cloud Computing technology is a way to supply computer applications to users without purchasing, installing, or supporting software on their local computers or servers. Educational institutions have started to benefit from the existing applications hosted on a 'cloud' (Sony & Jupta, 2021).

Today, the cloud based platforms give no cost services to educational institutions, such as mail, messaging and collaboration tools (e-mail,contacts, and calendars), office applications (document

storage, creation and sharing documents) and platform applications (the ability to create websites or learning management systems (Sclater, 2020).

Modern technology offers many benefits to the educational organizations. Jones and Sclater (2020) identified these advantages as follows:

- Cloud Computing is a novel computing paradigm.
- Infrastructure resources (hardware, storage and system software) and applications are presented in X-as-a-Service manner. When these services are introduced by an independent provider to external customers, Cloud Computing is based on pay per- use business models.
- Basic features of Clouds are virtualization and dynamic scalability on demand.
- Utility computing and SaaS are provided in an interrelated manner, even though utility computing might be consumed separately.
- Cloud services are consumed either via Web browser or via a defined API.

Good practice in Cloud computing language classroom includes the integration of interaction and the software to create the potential for success. The courses offered by means of Cloud wide variety of technologies to ensure that students spend a significant computing must use amount of time listening to and speaking the target languages (Thomas & Knezek, 2018).

Similarly, Paechter and Maier (2020) emphasize that teachers can design online tests for students, deal with and create better content resources for students through content management, evaluate and correct the tests, homework, and projects done by students, send the feedback and communicate with students through online forums. This automatically decreases the cost of organizational expenses and offers more powerful functional capabilities.

Benefits of Implementing Cloud Technologies in EFL Classroom Settings:

Cloud computing for education is the best way to respond to the increasing demands coming from all sides while also dealing with declining budgets and resources. It accommodates the current dependency on technology and helps bring education into the future. The educational system faces increasing demands from students, teachers and parents to provide personalized and differentiated learning environments, based on the needs and preferences of the students. But as these demands come in, schools continue to face budget constraints or cuts, making it a seemingly schools continue to face budget constraints or cuts, making it a seemingly take a look at how cloud computing can solve this problem.

For Teachers, understandably, there's a fear that technology might not be the best way to go about education. After all, hearing a teacher shout "Hey! No texting in class!" has become all too familiar. But that's not what we mean when we say that teachers should embrace technology. With the cloud, teachers can bring innovation back into the classroom. They can create collaborative and interactive lesson plans, post assignments, textbook excerpts or extra resources online, and even offer extra help outside of school. They can use cloud-based education applications that enable individualized learning based on performance data and student preferences. Additionally, a teacher's day continues after school ends. With the cloud and remote access capabilities, teachers can complete extra tasks, like grading, easily from home.

For Students, most students already use technology on a daily business. They enjoy items like personal mobile devices, and they're experts at using them. That's why technology is the perfect way to reach students in an educational setting. Of course, technology shouldn't distract from learning – but it can, and should, support it. Thanks to the cloud, schools can now embrace initiatives like Bring Your Own Device (BYOD), which takes education to the student

level and allows them to better engage in the learning process. Don't forget that students have busy lives too. Just like teachers and staff, a student's day doesn't end when school ends. Often, they head directly to another activity, whether it's team practice, rehearsal, lessons, work, or simply a social event. With cloud computing and BYOD, they can be productive on-the-go and work around these other commitments. It's easy to access assignments online, complete assigned reading without lugging around a heavy textbook, or participate in group projects. Cloud computing creates a more productive group environment in which students don't need to match up their schedules with others'. Instead, they can access and edit documents at the same time via the Internet, collaborating from afar.

Greengard (2020) has introduced some benefits, such as easy access to computing infrastructure with low cost, enhancing collaboration efforts and access to the most modern software and hardware. These benefits are also perceived by general users in some studied groups.

Creeger (2019) identified some basic advantages of a migration to Cloud Computing related to development, cost cutting and performance:

- Interoperability – ability to adapt with different software platforms;
- High computing capacity – HPC capacity (high processing computing);
- Data in Cloud – security and several storage capacity in servers;
- Cost cutting, by pay per use (not by licenses);
- Rapid system application, quick to adapt or change systems;
- Opportunity of reducing fixed costs, helping their change into variable costs.

Furthermore, Riasati, Allahyar and Tan (2021) reported that there are two other very important advantages. The first is the freedom and flexibility offered to the teaching institutions in being disconnected

from flexibility offered to the teaching institutions in being disconnected from where nothing is impossible with the help of various options of applying Cloud Computing applications. The second is the interoperability, which is the ability to integrate different platform systems (Windows and Linux; Linux and Windows), which is regarded as an essential quality of Cloud Services Platforms.

Limitations of Cloud Computing

There are many benefits of Cloud Computing irrespective of the size of the organization. But there are some limitations, as well, since it is still an evolving technology. Some weaknesses of cloud computing are listed below:

Network connection:

The concept supposes that the customer has reliable network connection. If there is a problem with network connectivity, accessing the cloud becomes a problem, as well. Performance of the cloud applications also relies on the network performance at the customer's side. Speeds of uploading and downloading are slower comparing to that of a local server.

Control of data security:

In a public cloud, the customer cannot control the security of his/ her own data. The customer's data might be vulnerable to hacking or phishing attacks. Since the servers on cloud are interrelated, malware can easily spread.

Additional costs:

Despite the fact that cloud computing introduces cost benefits, it has other hidden or additional costs, as well. Customers are charged extra for data transfer or other services. Initial offerings have higher prices, till economies of scale develop the service provider.

Peripherals:

Peripheral devices such as printers or scanners might not work with cloud. Many of them need software to be installed locally. However, networked peripherals cause few problems.

Integration:

Integrating internal applications with cloud applications can be complicated and in some cases not possible.

Generic:

Public cloud offerings are very generic and offer multi-tenancy service which all institutions might be uncomfortable with. Implementing an in-house cloud is very difficult to implement and are troublesome on internal resources if the institution is small.

Related Studies to Cloud Computing

Many studies in the field of Cloud Computing have been in the areas of new technologies, general explanation of the cloud technology, differences among similar technologies, security requirements and the future expectations in these environments.

Delgado (2020) tried to clarify concerns about performance in cloud computing, analyzing the factors that make the performance of clouds unpredictable and suggesting ways to solve this problem. The performance degradation because of virtualization and the lack of isolation between virtual machines were empirically evaluated in a Eucalyptus tested based on the KVM virtualization. Drawing upon previous research, all the parts of the problem, from the behaviour of specific application types when hosted in clouds to a proposal for a new generation of SLAs with performance guarantees, discussed. The research concluded that clouds have difficulties in meeting the needs of certain kinds of workloads, while successfully adapting to others.

Kravtsov and Chemisova's research (2018) aimed at exploring the state of using SaaS cloud services by the teachers and students of Kherson State University (KSU). 80 from 100 teachers and 220 from 500 students were questioned of the Faculty of Preschool and Primary education and Faculty of Physics, Mathematics and Computer Science. The method of questioning was used to exposure the attitude of tutors and students to use SaaS cloud services in a blended learning LMS «Kherson State University». The researchers designed a questionnaire which consisted of questions that reflect: degree of use of cloud services in a professional activity of the teacher; ─willingness of the teacher to learn new software; awareness of teachers about cloud technologies in educational process. The results of experimental research have shown the limited use of cloud technologies in distance learning due to lack of awareness of teachers in the possibilities of their use.

Commentary:

In light of the above mentioned related studies, it was clear that Cloud Computing program have a positive effect on developing EFL learning and teaching. This has been shown through studies (Delgado,2020; ; Kravtsov and Chemisova, 2018). Almost all studies have used pre -post test, questionnaires, and classroom observations to collect data. It can be noticed interviews, that no studies investigated other constructs such as self-research, self-evaluation and feedback with Cloud Computing program.

The present research benefited from the review of literature and related studies in forming the research hypotheses and designing the research instruments. This research is in line with the previously mentioned studies in that giving students training dealing with vocational education would help them process technical terminology effectively. The research supposes that when students are taught technical terminology through using Cloud Computing program, they could actively engage in the ESP process.

10-The Research Design:

The present research used a quasi-experimental pre-post tested control- experimental group research design. So, four groups (n=100) students from first year students at Faculty of Applied Arts New Cairo Academy were randomly selected from the two specializations of (Interior Design and Marketing) to present two experimental groups and two control groups. For developing technical terminology, the experimental groups were taught throughout the regular instruction method. Two pre-post technical terminology tests, i.e. one for each specification and two questionnaires were administered to the four groups (two experimental groups and two control group) before and after treatment.

11-Participants:

The participants of the present research consisted of (n=100) students who were selected randomly from 1st year students in the following specializations: (Interior Design and Marketing) at faculty of Applied Arts New Cairo Academy. Each specialization consisted of (n=50) students who were divided equally into two groups: an experimental group (25 students) and a control group (25 students).

12-Duration of the Experiment:

The program was distributed on 8 lessons for each specialization to be taught in 36 hours. The lessons were held once a week for each specialization and each session lasted for 3 hours. The experiment lasted for about 3 months; it started on October and continued till December in the Academic year 2020/2021.

13- Research Methodology:

In order to confirm the relationship between the independent variable (The Effect of Cloud Computing Program) , and the dependent variable (Developing Technical Terminology), the researcher used the quasi- experimental design which depends on the availability of the following conditions:

- Controlling the environment by isolating the variables resulting from normal activities, and keeping only the

experimental activity in the scope of the experiment to be subjected to measurement.

- Controlling the variables and method of their measurement.
- Controlling the process of selecting samples or groups.

14-Research Variables:

a- Independent Variable:

- The Effect of Cloud Computing Program

b- Dependent Variable:

- Developing English Technical Terminology

The researcher took the following considerations into account to avoid the impact of external variables:

- The time available for researching the program:

The experiment was applied on the groups during the same period which was the first semester in the Academic year 2020/2021.

- Students' background about the program:

Both experimental and control groups had similar backgrounds about the program, as the members of the groups studied the same programs in the last academic year.

- The time of taking the pre/post test:

It was taken into consideration that giving the pre-post test to the members of the groups must be at the same time.

- The program content: the same lessons were taught for both the control and the experimental groups for each specialization but through different methods.
- Instructor: to help control the effect of the external variables, the researcher taught the selected units of the syllabus to both experimental and control groups herself.

15-Instruments of the research:

The research instruments consisted of:

- Two Needs Analysis Checklists.

- Two Questionnaires.
- Two pre-post tests.

Needs Analysis Checklists:

- The Aim of the Checklists:

The checklists were designed by the researcher to determine the most important technical terminology needs required for the first year specialized in Interior design and Marketing.

- Sources of the Checklists:

  The technical terminology included in the checklists in the primary form was determined through reviewing a number of related studies, books and references focusing on developing technical terminology.

- Content of the Checklists:

The first checklist for Interior Design Specialization consisted of 10 items. The second checklist for Marketing Specialization consisted of 10 items. (See Appendix I)

- Validity of the Checklists:

  The two checklists were submitted to a panel of seven jury members specialized in the field of Applied Arts to determine:

  a. The degree of importance of the technical terminology to the 1st year Applied Arts Students' needs.
  b. The appropriateness of the technical terminology to the 1st year Applied Arts Students' needs.

  The jury suggested ordering the items according to their importance and grouping the items according to their similarity in the topic. Furthermore, the jury confirmed that the two checklists were valid and the items included were adequate and clear.

Technical Terminology Questionnaires:

Two questionnaires (Students' questionnaire and Professors' questionnaire) were designed to determine the

students' needs concerning technical terminology in the English language. They aimed to determining the students' needs of English language in general and the students' needs of technical terminology in particular. (see Appendices II and III).

- **The Aim of the two Questionnaires:**
  The questionnaires were designed to identify the most important technical terminology required for the 1st year Applied Arts Students specialized in Interior design and Marketing.

- **Sources of the Two Questionnaires:**
  The questionnaires were derived from the following resources:

  a- Interviews
  - Interviews with students
  - Interviews with ESP teachers

  b- Previous Studies; such as Berry (2018), Fu (2019), Ghenghesh (2021) and Intaraprasert (2022) studies.
  c- Sources of previous Tests: Comparing the students' marks in English including technical terminology and the other English language courses, they studied in the academy.

- **Construction of the Questionnaires:**
  The two questionnaires were designed in a way that would help in identifying the students' needs of technical terminology. Some of the items were selected and modified from similar research studies, as well as published materials available in the reference books, volumes and Periodicals. Others were slightly modified in order to suit the existing situation.

- **Content of the Questionnaires:**
  a- The Students' Questionnaire:
  Students' questionnaire was presented in two different models, one for each specialization: Interior Design and

Marketing. Each model of the questionnaire consisted of two parts. The first part included six questions that assessed the use of English language in general. The second part included twenty questions that assessed the use of technical terminology in particular. Then students could express their opinions in the last question which left enough space for any comments or related views concerning the questionnaire. The (100) students who participated in responding to this questionnaire were divided into (2) groups according to their specialization.

b- The Applied Arts Professors' Questionnaire:

The Applied Arts Professors' Questionnaire assessed the use of technical terminology. The questionnaire consisted of sixteen questions that assessed: (1) the use of English in technical classes in general. (2) what professors believe their students' needs. (3) the use of technical terminologies. (4) methods used in teaching new technical terminology. The total number of professors who participated in this questionnaire was 21 with a 100% response rate from different departments of the faculty.

- **Validity of the Questionnaires:**

The questionnaires were submitted to a panel of seven jury members specialized I the field of English language teaching and Applied Arts to validate:

a- Selection of question types.
b- Ordering of questions
c- Accuracy and clarity of questionnaires items
d- Any suggestions for addition and omission.

The jury suggested the following:

1- Omitting some questions as they were difficult for the respondents to understand.

2- Some items should be included to clarify the purpose of the questionnaire.
3- Some changes in the form and layout of one of the questionnaires were recommended.

- **The Two Specifications' Programs (See Appendices IV and V)**

The researcher designed two cloud computing programs for the two experimental groups, i.e The interior design group and the marketing group. In each of them, she worked out students' needs in relation to their specialization. In this research, the use of Cloud Computing program in EFL is popular in teaching ESP. The graphic format and online activities proved to be helpful for enhancing the technical terminology for first year applied arts students.

- **Aim of the Programs**

The programs of the present research aimed at developing technical terminology for applied arts students specialized in interior design and marketing by using cloud computing program.

An example of one of the program's aims and objectives will be given here:

Marketing program's aim and objectives:

The marketing program aims to provide students with the basic knowledge of terminology in marketing to enable them to effectively and efficiently perform their duties in marketing field. Upon the completion of the program, students would be able to use marketing terminology in the following areas:

- Defining the role of the technical system I the market economy.
- Appreciating the philosophy of marketing.
- Appreciating the need for an effective marketing.
- Achieving organizational goals depending on knowing the needs of target markets.
- Being aware and sensitive of day-to-day marketing.

- Anticipating the needs and wants of consumers and satisfy these more effectively than competitors.

The programs' Description:

The descriptions of the specializations programs; i.e. Interior design and Marketing taught during the research experiment with their lessons are shown in details in Appendix V.

Implementation of the program:

The implementation of the program lasted nine sessions; one session per week including an orientation session, every session took 180 minutes. The program was conducted in eight weeks within three months (October, November and December) during the first term of the academic year 2020/2021.

Warm-up

This stage was called ice-breaking stage. This was achieved through holding an introductory session to the students. It was held directly after the researcher told the students about the program and how it is different from their daily regular classroom teaching. At this introductory session, the researcher told the students about the program: its objectives, its rationale and how they will benefit from it. Increasingly, the researcher showed them how they could use the platform, download files or programs, upload files on their academic mails, and print documents from the platform. Additionally, the researcher told them they would learn many computer and Internet skills and they would have much fun by learning on the web. Hence, the participants were enthusiastic to participate in the program. In the second session, the researcher began teaching the experimental group on the mechanism of dealing with the Cloud Computing applications program and its components.

The Application Step

The researcher started with the administration of the pre and post-test of Technical Terminology. Then, the researcher told the experimental group about the weekly teaching times. They used to meet them once a week: on Saturday so as not to contradict with daily schedule. The meeting or teaching time was about three hours once a week. Then the teacher started teaching the Cloud Computing Applications program as follows:

Cloud computing applications program Lesson Plan

Each lesson plan followed the same sequence of Cloud Computing applications program components. Cloud computing program included the technical terminologies to be developed.

- **Introduction**:

It provided background information and assigned the roles that students would play.

- **Task:**

It was about what the students should do and would accomplish by the end of the Cloud Computing program.

- **Process:**

It told the students about the steps they should follow to carry out their tasks and finish them successfully. A number of media were used to accomplish this research as: (Microsoft Teams, WhatsApp, You tube, Hangouts, Google Drive, Facebook)

- **Resources:**

The researcher provided the students with some resources to carry out their tasks competently and successfully as: the web pages, the links, the hyperlinked icons and graphic organizer.

- **Evaluation:**

The program provided answer sheets after each session as a feedback evaluation to get the participants evaluate their learning.

- **Conclusion**:

It aimed at reminding students of what they have done throughout the Cloud Computing program. In this stage, the teacher gave them reinforcement and encouragement for what they have accomplished.

The Pre- Post Test:

- **Aim of the Test:**

To achieve the aim of the present research, a technical terminology test was designed by the researcher. It was used as a pre and post- test to investigate the effect of the cloud computing program on developing technical terminology in two different specializations; interior design and Marketing. So a distinctive form of the test was designed for each specialization.

- **Construction of the Test:**

The researcher designed two pre –Post Tests of technical terminology for the two specializations through:

- Identifying the goal of the Pre-Post Tests.
- Preparing a set of vocabulary used in the Pre- Post Tests.
- Modifying the Pre- Post Tests according to the jury members' recommendations.
- Estimating the reliability for the Pre- Post Tests.
- Investigating tests' validity.
- Specifying the appropriate time for testing.

- **Content of the Test:**

Each Pre- Post Test preparation was based on the items and aims of the lessons to be taught in the suggested program. Each Pre-Post Test included the following types of questions:

- True/ False questions.
- Match the terms with definitions.

- Put the items into the appropriate categories.
- Complete the sentences.
- **Validity of the Test:**

It was submitted to jury members specialized in the field of methods of teaching English to test the validity and the appropriateness.

To measure the reliability of the test, the test -retest reliability was counted. It was r = 0.59. So, the test was reliable and could be used before and after the experiment. The final version of the test is shown in appendix (VI)

16-Data Analysis and Results:

The results of the research are discussed and interpreted in relation to the research questions and hypotheses, mentioned earlier, as follows:

The First Hypothesis of the Research:

1- In order to verify the first hypothesis stating that "There are statistically significant differences between the mean scores of the experimental groups and those of the control groups in the post administration of the technical terminology test, in favour of the experimental groups" , the researcher used the following (t) formula(Morad, 2000, p. 245).

$$t=\frac{M1-M2}{\sqrt{\frac{\{(Sd1)+(Sd2)\}}{(N-1)}}}$$

Where:

t: The calculated value of the difference between mean scores.

Ml: The mean score of the experimental group students.

M2: The mean score of the control group students.

Sdl: Standard deviation of the experimental group.

Sd2: Standard deviation of the control group.

N: Number of pairs of students.

"t" = (16.6) Significant at the level (0.05)

The following table (1) shows that there was a statistically significant difference between the mean scores of the experimental groups and the control groups on the post – administration of the pre-post test.

Table (1)

Significant difference between the mean scores of the experimental group and the control group students in the test post administration of the test at (0.05 level)

Group	Std Deviation	D.F.	Mean	N	Calculated t- value	Tabulated T	Level of Significance
Control	5.239	130	28.18	50	7.003	2.358	Sig. at (0.05)
Experimental	4.04		33.89	50			

The above **Table (1)** confirms the following:

1- The experimental group students' mean score (33.89) was higher than the mean score of the control groups students (28.18) on the post administration of the technical terminology test. This showed that the experimental group's students attained higher scores than the control groups students in the post- administration of the technical terminology test due to the use of the cloud computing program.
2- The calculated (t) value (7.003) was significantly higher than the tabulated "T" value (2.358) with (130) degrees of freedom at the 0.05 level of significance. Thus, there was a statistically significant difference between the experimental groups' students and the control groups' students' mean scores on the post – administration of the technical terminology test in

favour of the experimental groups' students. Thus, the first hypothesis of the research was verified.

The sub- Hypotheses of the first main hypothesis of the research

1-(a) In order to verify the first sub – hypothesis of the first main hypothesis stating that "There is a statistically significant difference between the mean scores of the experimental group (a) and the control group (a) of Interior Design Specialization in the post-administration of the technical terminology test, in favour of the experimental group." The above t- test formula of (Morad 2000: p. 245) was employed.

The following table (2) shows that there was a statistically significant difference between the mean scores of the experimental group and the control group students of " Interior Design Specialization" on the post – administration of the technical terminology test, and that any development in the experimental group's technical terminology would be due to using the cloud computing program in teaching them during the experiment.

Table (2)

Significant difference between the mean scores of the experimental group and the control group students in the test post administration of the test of Interior Design Specialization at (0.05 level)

Group	Std Deviation	D.F.	Mean	N	Calculated t- value	Tabulated T	Level of Significance
Control	3.5	65	27.17	25	6.22	2.423	Sig. at (0.05)
Experimental	3.95		34.172	25			

The above **Table (2)** confirms the following:

1- The experimental group students' mean score (34.172) was higher than the mean score of the control groups students (

27.17) on the post administration of the technical terminology test. This showed that the experimental group's students attained higher scores than the control groups students in the post- administration of the technical terminology test due to the use of the cloud computing program.

2- The calculated (t) value (6.22) was significantly higher than the tabulated "T" value (2.423) with (65) degrees of freedom at the 0.05 level of significance. Thus, there was a statistically significant difference between the experimental groups' students and the control groups' students' mean scores on the post – administration of the technical terminology test in favour of the experimental groups' students. Thus, the first sub- hypothesis of the first main hypothesis of the research was verified for " Interior Design Specialization" Students.

1-(b) In order to verify the second sub – hypothesis of the first main hypothesis stating that "There is a statistically significant difference between the mean scores of the experimental group (b) and the control group (b) of Marketing Specialization in the post-administration of the technical terminology test, in favour of the experimental group." The above t- test formula of (Morad 2000: p. 245) was employed.

The following table (3) shows that there was a statistically significant difference between the mean scores of the experimental group and the control group students of " Marketing Specialization" on the post – administration of the technical terminology test, and that any development in the experimental group's technical terminology would be due to using the cloud computing program in teaching them during the experiment.

Table (3)

Significant difference between the mean scores of the experimental group and the control group students in the test post administration of the test of Marketing Specialization at (0.05 level)

Group	Std Deviation	D.F.	Mean	N	Calculated t- value	Tabulated T	Level of Significance
Control	6.417	65	28.614	25	3.595	2.423	Sig. at (0.05)
Experimental	4.533		34.616	25			

The above **Table (3**) confirms the following:

1- The experimental group students' mean score (34.616) was higher than the mean score of the control groups students (28.614) on the post administration of the technical terminology test. This showed that the experimental group's students attained higher scores than the control groups students in the post- administration of the technical terminology test due to the use of the cloud computing program.

2- The calculated (t) value (3.595) was significantly higher than the tabulated "T" value (2.423) with (65) degrees of freedom at the 0.05 level of significance. Thus, there was a statistically significant difference between the experimental groups' students and the control groups' students' mean scores on the post – administration of the technical terminology test in favour of the experimental groups' students. Thus, the second sub- hypothesis of the first main hypothesis of the research was verified for " Marketing Specialization" Students.

The Second Hypothesis of the Research:

2 - In order to verify the second hypothesis stating that" There are statistically significant differences between the mean scores of the experimental groups in the pre and post administration of the

technical terminology test, in favour of the post- administrations.", the following (t) formula was used (Khatab, 2010).

$$t=\frac{Dm}{\sqrt{\frac{\{(Dd2)\}}{N(N-1)}}}=22.6$$

Where:

t: the calculated value of the difference between the mean Scores.

Dm: the general mean score of the differences between pairs of scores.

Dd: the deviation of the differences from their general mean scores.

Table (4)

(t) value, mean scores and standard deviation of the experimental

Experimental Group	Group Number	Means of the pre and post test	Standard Deviation	D.F	Calculated t- value	Tabulated T	Level of Significance	Effect size
Pre-test	50	22.4	4.02	65	66.93	2.416	Sig. at (0.05)	0.98
Post-test	50	33.89	4.04					

group in the pre and post administrations of the test and the Effect size.

The above **table (4)** confirms the following:

1- The mean score of the experimental groups' students on the technical terminology test post- administration (33.89) was higher than the mean scores on the pre- administration (22.4). Thus, the development of the students' technical terminology of the experimental groups due to the use of the cloud computing program in teaching them during the experiment.
2- The calculated (t) value (66.93) was significantly higher than the tabulated "T" value (2.416) with (65) degrees of freedom at the 0.05 level of significance. Thus, there was a statistically significant difference between the experimental groups' students and the control groups' students' mean scores on the pre and post – administration of the technical terminology test in favour of the post – administration of the test. Thus, the second main hypothesis of the research was verified.

The sub- Hypotheses of the second main hypothesis of the research

2-(a) In order to verify the first sub – hypothesis of the second main hypothesis stating that "There is a statistically significant difference between the mean scores of the experimental group (a)

of Interior Design Specialization in the pre and post administration of the technical terminology test, in favour of the post-administration." the above (t) formula was employed (Khatab, 2010).

Table (5)

(t) value, mean scores and standard deviation of the experimental group students of Interior Design Specialization in the pre and post administrations of the test and the Effect size.

Experimental Group	Group Number	Means of the pre and post test	Standard Deviation	D.F	Calculated t-value	Tabulated T	Level of Significance	Effect Size
Pre-test	25	23.54	4.396	65	74.214	2.518	Sig. at (0.05)	0.99
Post-test	25	34.64						

The above **Table (5)** confirms the following:

1- The mean score of the experimental group students on the technical terminology test post- administration (34.64) was higher than the mean scores on the pre- administration (23.54). Thus, the development of the students' technical terminology of the experimental group of the Interior Design Specialization was due to the use of the cloud computing program .

2- The calculated (t) value (74.214) was significantly higher than the tabulated "T" value (2.518) with (65) degrees of freedom at the 0.05 level of significance. Thus, there was a statistically significant difference between the experimental group's students and the control groups' students' mean scores on the pre and post – administration of the technical terminology test in favour of the post – administration of the test for Interior Design specialization students. Thus, the first sub- hypothesis of the second main hypothesis of the research was verified.

2-(b) In order to verify the second sub – hypothesis of the second main hypothesis stating that "There is a statistically significant difference between the mean scores of the experimental group (b) of Marketing Specialization in the pre and post administration of the technical terminology test, in favour of the post-administration." the above (t) formula was employed (Khatab, 2010).

Table (6)

(t) value, mean scores and standard deviation of the experimental group students of Marketing Specialization in the pre and post administrations of the test and the Effect size.

Experimental Group	Group Number	Means of the pre and post test	Standard Deviation	D.F	Calculated t-value	Tabulated T	Level of Significance	Effect Size
Pre-test	25	22.068	3.758	65	27.95	2.518	Sig. at (0.05)	0.974

Post-test	25	34.177	3.950

The above **Table (6)** confirms the following:

1- The mean score of the experimental group students on the technical terminology test post- administration (34.177) was higher than the mean scores on the pre- administration (22.068). Thus, the development of the students' technical terminology of the experimental group of the Marketing Specialization was due to the use of the cloud computing program .
2- The calculated (t) value (27.95) was significantly higher than the tabulated "T" value (2.518) with (65) degrees of freedom at the 0.05 level of significance. Thus, there was a statistically significant difference between the experimental group's students and the control groups' students' mean scores on the pre and post – administration of the technical terminology test in favour of the post – administration of the test for Marketing specialization students. Thus, the second sub- hypothesis of the second main hypothesis of the research was verified.

Answering the first Main Question of the research:

1- The first question of the research was: " What are the needs of First year Applied Arts student concerning technical terminology?"

In order to answer this question:

a- Two questionnaires were used : the first was for the students and the second was for the Applied Arts Professors in order to identify the needs of students specialized in Applied Arts concerning technical terminology. For the questionnaires see appendix ( )

b- Two checklists for listing the needs of the students specialized in " Interior Design and Marketing specializations" concerning technical terminology based on the results of the responses of the students and their professors to the above mentioned two

questionnaires were set and shown in appendix( ). So, the first question of the research was answered as the needs of the students specialized in Applied Arts concerning technical terminology were determined in these two checklists.

Answering the first sub- question of the first Main Question of the research:

The first sub- question of the first main question of the research was: "what are the needs of student specialized in interior design concerning the interior design technical terminology?"

In order to answer this question:

a- Two questionnaires were used : the first was for the students and the second was for the Applied Arts Professors in order to identify the needs of students specialized in Interior Design Specialization concerning technical terminology.

b- A checklist for listing the needs of the students specialized in " Interior Design specialization" was set to present the students' needs concerning technical terminology . So, the first sub- question of the first main question of the research was answered.

Answering the Second sub- question of the first Main Question of the research:

The Second sub- question of the first main question of the research was: " what are the needs of student specialized in Marketing concerning the marketing technical terminology?"

In order to answer this question:

a- Two questionnaires were used : the first was for the students and the second was for the Applied Arts Professors in order to identify the needs of students specialized in Marketing Specialization concerning technical terminology.

b- A checklist for listing the needs of the students specialized in " Marketing specialization" was set to present the students' needs concerning technical terminology . So, the second sub- question of the first main question of the research was answered.

Answering the Second Main Question of the research:

To answer the second main question of this research and its two sub questions concerning the Effect size of using cloud computing program on developing technical terminology for first year Applied Arts students , the following effect size formula in Morad (2000, p. 248) was used:

$$\text{Effect size}=\frac{(t)^2}{(t)^2+df}$$

The criteria to which the effect size is judged are:

Value of ((η2)) 0.2= small effect size.

The value of ((η2)) 0.5= medium effect size.

The value of ((η2)) 0.8= large effect size.

The second main question of the research was: " What is the effect of using Cloud Computing Program on developing technical terminology for First year Applied Arts Students?"

The effect size is obvious in the following table (7)

Table (7)

The Effect size on developing technical terminology for students specialized in Applied Arts in general

Using Cloud Computing Program	"t " value	df	η2	Effect Size
	66.93	130	0.986	Large

From table (7) above, it can be concluded that using cloud computing program has a large effect size of (0.986) on developing technical terminology for Applied Arts Students. So, the second main question of the research was answered.

Answering the first sub- question of the second Main Question of the research:

The question was : " what is the effect of using Cloud Computing Program on developing technical terminology for First year Applied Arts Students specialized in Interior Design?"

The effect size of using cloud computing program on developing technical terminology for Applied Arts students specialized in Interior Design specialization is obvious in the following table :

Table (8)

The Effect size on developing technical terminology for students specialized in Interior Design Specialization

Using Cloud Computing Program	"t " value	Df	η2	Effect Size
	74.214	65	0.996	Large

From table (8) above, it can be concluded that using cloud computing program has a large effect size of (0.996) on developing technical terminology for Students of Interior Design Specialization. So, the

first- question of the second main question of the research was answered.

Answering the second sub- question of the second Main Question of the research:

The question was : " what is the effect of using Cloud Computing Program on developing technical terminology for First year Applied Arts Students specialized in Marketing?"

The effect size of using cloud computing program on developing technical terminology for Applied Arts students specialized in Marketing specialization is obvious in the following table :

Table (9)

The Effect size on developing technical terminology for students specialized in Marketing Specialization

Using Cloud Computing Program	"t " value	Df	η2	Effect Size
	27.9	65	0.974	Large

From table (9) above, it can be concluded that using cloud computing program has a large effect size of (0.٩٧٤) on developing technical terminology for Students of Marketing Specialization. So, the second - question of the second main question of the research was answered.

Discussing the Research Results:

Comparing the performances of the Experimental groups and the control groups, the results showed that there were statistically significant difference in the mean scores of the post administration of the pre- post technical terminology test between the two experimental groups and the two control groups of the research.

Analysing the obtained data of the research, it was found that the two experimental groups performed in the post administration of the pre- post technical terminology test significantly better than their performance in the pre- administration of the pre- post technical terminology test.

In this case the analysed data of the present research showed clear evidence that the treatment was successful in developing technical terminology for the experimental groups of Applied Arts Students and for each experimental group in Interior Design and Marketing in particular.

Moreover, the results of the present research showed evidence of the large effect of cloud computing program on the two experimental groups' mean score on the post – administration of technical terminology test in general (0.986) and on each experimental group of the two experimental groups of Interior Design (0.996) and Marketing (0.974) in particular. All these effect sizes were larger the large effect size criterion (0.8) .

17-Conclusions:

All these large effect sizes can be attributed to several factors. These factors will be discussed in relation to the two proposed programs designed to develop technical terminology for Applied Arts Students through the use of the cloud computing program applications in general and the included content material, activities, aids, procedures and techniques in particular:

1- Analysing the students' needs of technical terminology in the English language through the students' questionnaires and their professors' questionnaires and setting them in two checklists to be judged by experts according to the students' specific specialization before preparing the programs contents and activities helped greatly in meeting the students' needs.
2- Students were enthusiastic to participate in the programs' actively to use the terminology that came in the programs as a result of their opinions expressed in the questionnaire. They discovered that the terminology taught in the programs' lessons was

intensively chosen by the researcher to satisfy their needs, support their ideas, and achieve their goals of succeeding in the exams, being able of completing their higher studies and joining future distinguished jobs both at the local and international levels.

3- Integrating the cloud computing applications in teaching technical terminology might be the strategic mean that led to the achievement of the large effect size in developing this terminology for the two experimental groups of two different specializations; Interior Design and Marketing. This may be due to the diversity and variation in the methodology of teaching and its techniques.
4- Furthermore, some students expressed their positive attitudes towards the program. Here are some of their comments:
    - The Cloud computing program is a nice tool and is easy to use.
    - I would like to be taught by Cloud Computing program even in other subjects.
    - Cloud Computing program helped me interact with my classmates.
    - It helped me broaden my computer information and work on office.
    - I have learnt how to do research on the Internet.

5- A number of studies such as Ahmed (2016), Abdallah (2013), Hà(2015), Khodary (2014), Kyunho (2016), Khonamri & Karimabadi (2015), Jasim (2017), Ammar (2013), Rashidi & Asgharzadeh (2012), Yousef & Mohammadi (2016), & Ismez (2019) were in line with the current research. Results of these studies concluded the positive impact of cloud computing program as an instructional tool that enhanced language skills.

6- On the other hand, studies conducted by Delgado (2010), Curtmola, Carpinelli & Hirsch (2014) revealed that cloud

computing as an instructional tool in content learning has not provided learners with better educational experiences.

7- The researcher's observations during the experiment revealed that students exhibited more confidence while searching for information about their topics as the days progressed. As a teacher, the researcher was very comfortable knowing the links were already provided and the resources were developmentally appropriate for their age group online. Some students expressed that the textbook was full of dull information whereas the Cloud Computing program had colourful attractive pages and interactive online tools and the videos or pictures that support the topics.

8- Cloud computing program allowed both teachers and students to learn through a method that is more effective, engaging, and meaningful. However, some teachers confirmed that the worst thing was, sometimes, the unavailable resources and the short time allotted to complete the tasks in addition to students' computer-ratio that made some students do not benefit completely from Cloud Computing program as planned.

9- Using cloud computing program encouraged students to participate in the learning process and changed the teachers' role to act as a facilitator, a guide, a course designer, and a collaborator.

10- Analysing the students' specific needs of technical terminology in Interior Design and Marketing , and designing a program of each specialization , not just following an off- the – shelf course or course book ; understanding the nature of the students' subject area; working out the students' language needs in relation to their specialization ; using authentic materials; motivating students with variety , relevance and fun and taking the classroom into the real world and bringing the real world into the classroom, helped the researcher (as an instructor) to offer the cloud computing

program as a very useful teaching method for the development of technical terminology.

18-Recommendations of the Research:

In the light of the results and conclusions of the research, the following recommendations are proposed:

1- Technical terminology checklists that is derived from the needs analysis should be used and functionalized in designing courses to assist students to become more motivated and to increase students' positive attitudes towards learning English language that is relevant to their specializations.
2- Students at the undergraduate level need English language courses that meet their needs and desires. So, it is recommended that these courses should be designed in interactive teaching methods that meet students' needs of learning English and should be used as well.
3- Teaching technical terminology should be one of the main educational targets.
4- The students' needs should be given more attention in our educational system and in English classes.
5- More time and effort should be devoted to develop technical terminology and technical needs in general.
6- Using effective teaching methods that are based on students' participation, variation are of great importance to improve students' competency , confidence, motivation and to encourage understanding and retention of information.
7- Applied Arts students at the faculty of Applied Arts should be taught by using effective teaching methods concerning technical terminology.
8- English language students at the faculty of Education should be trained on using Cloud computing in teaching English language skills.

9- Considering the time of teaching new terminology as students may be exhausted at the end of the day which affects on the scores and the results of the students .

19-Suggestions for Further Research:

Based on the findings of the current research, the following areas for future research were suggested:

1- Using Cloud Computing program in developing other subjects as well like Math, Science, Social Studies…etc.
2- Investigating the Effect of Cloud Computing based program on other English language skills specially listening and speaking.
3- Applying the experimental treatment on larger samples.

References

Abdul ghani, Salwa (2013), *" ESP Reading: Some Implications for the Design of Materials." English Teaching Forum , 31 (4).*

Abu El-Ala, N. & Awad, W. (2020). Cloud computing for solving e-learning problems. *(IJACSA) International Journal of Advanced Computer Science and Applications, 3*(12), 135-137.

Anthony, L. (2020). " English for Specific Purposes: What does it mean? Whyy is it different?. " Department of Information and Computer Engineering, Faculty of Engineering , Okayama University of Science. Available: www.antlab.sci.waseda.ac.jp/abstracts/.html

Armbrust, M., et al. (2019). Above the clouds: A Berkeley view of cloud computing. Tech. Rep. UCB/EECS-2009-28, EECS Department, U.C. Berkeley.

Bell, A. (2012). " Help, Ihave been asked to teach a class of ESP!" Latefl Voices, issue no. 169.

Berry, S. (2018). How to Give Effective Feed back to your Students.

Birch, K., & Tyfield, D. (2013). Theorizing the bioeconomy: Biovalue, biocapital, bioeconomics or... what?. Science, Technology, & Human Values, 38(3), 299-327.

Boarcas, B. (2019). ESP teaching problems and Solutions" Intertext, 3 (4) , p. 67

Brown, D. (2017). " Principles of language Learning and Teaching ." (5th ed) . San Francisco State University.

Butzkamm, M. (2013). " We Only Learn Language Once. The role of the Mother Tongue in FL. Classroom: Death of a Dogma". *Language Learning Journal , vol.28, pp. 29-39.*

Curtmola, R., Carpinelli, J., & Hirsch, L. (2014). Cloud Computing for Education: A Professional Development Program for High School Teachers. 121st ASEE Conference and Exposition. American Society for Engineering Education.

Chauhan, P. (2012). Cloud computing in distributed system. *International Journal of Engineering Research & Technology (IJERT), 1*(10), 1-9.

Chen, B. (2013) . " Internet- Assisted Language Learning and Professional Development" . Seminar on Multimedia English Teaching, Chungtai Institute of Health, Science and Technology.

Chiu, F. (2014). The application of a cloud-based student, teacher, and parent platform in English as a foreign language education. *OJET: The Turkish Online Journal of Educational Technology, 13*(3), 178-187.

Cotton, K. (2020). Classroom questioning. *School improvement research series*. Retrieved from http://www.learner.org/ channel/workshops/socialstudies/pdf/ session6/6.Classroom Questioning.pdf.

Creeger, M. (2019). Cloud computing: An over-view. *Queue, 7*(5).

Delgado, V. (2020). *Exploring the limits of cloud computing*. (Published master's thesis). KTH Information and Communication Technology, Stockholm, Sweden.

Fiorito, M. (2020) " Teaching English for Specific Purposes (ESP) ." Retrieved on 31st March , 2020 . http://www.using English.com

Fu, G. (2019). " theme based group teaching of college oral English: Endorsed by students in Chinese EFL context." English Language Teaching, 4(1) p. 33-41

George, R. (2019*).* *Cloud application architecture: Building Applications and Infrastructure in the Cloud. (*1st ed.). San Francisco: O'Reilly

Gillam, L., Cooke, N., & Skinner, J. (2019). Towards executable acceptable use policies (execAUPs) for email clouds. IEEE e- Science 2009 Workshop on Cloud-based Services and Applications.

Gillam, L., Li, B., & O'Loughlin, J. (2021). Teaching Clouds: Lessons Taught and Lessons Learnt. In L. Chao *Cloud computing for teaching and learning: Strategies for design and implementation.* (pp. 82-94). Heresy, USA: IGI Global.

Greengard, S. (2020). Cloud computing and developing nations. *Communications of the ACM, 53*(5), 18–20.

Gupta, P., Seetharaman, A., & Raj, J. (2021). The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management*. [Online]. 33(5), 861–874 Available at: http://linkinghub.elsevier.com/retrieve/pii/S026840121 30 0087X

Harding, K. (2017). English for Specific Purposes. Oxford: Oxford UniversityPress.

Hayes, J. (2020). "Clouding the licensing issues? [Enterprise software licensing]". *Engineering & Technology (17509637), 5*(17), 52-53.

Kimrey Neill et al. (2020). Findings from NC Education Cloud Interview and Survey Process, A Report on Local Capacity to Plan, Implement, Sustain and Evaluate Large-scale Technology Initiatives. NCPDI Instructional Technology and NC Education Cloud Leadership. Web. Available at: https://www.fi.ncsu.edu/wpcontent/uploads/2013/05/CloudFindings.pdf

Kravtsov, H., Chemisova, I. (2014). Microsoft Cloud Services in Distance Learning System "Kherson Virtual University". *Information Technology in Education, 20*, 53-65.

Ludin, L. (2018). " Buzz words- Bang * Splat ! Criminal brief ." Don Martin School of Software , pp. 12-31.

Mell, P., & Grance, T. (2021). The NIST Definition of Cloud Computing. [Online]. U.S.A: National Institute of Standards and Technology(U.S. Department of Commerce). Available at: http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf

Misevicuene, R., Budnikas, G. & Ambrazien, D. (2021). Application of cloud computing at KTU: MS Live@Edu Case. *Information in Education, 10*(2), 259-270.

NIST, Cloud architecture reference models: a survey V2, Technical Report, National Institute of Standards and Technology, 2021.

Paechter, M., & Maier, B. (2020). Online or face-to-face? Students' experiences and preferences in e-learning. *The Internet and Higher Education, 13*(4), 292-297.

PARANET (2017). The three types of cloud computing models. Available at: https://www.paranet.com/blog/bid/128267/the-three-types-ofcloud- computing-service-models

Saleem, R. (2021). *Cloud computing's effect on enterprises*. (Published master's thesis). Lund University, Sweden.

Sclater. N. (2018). Web 2.0, Personal Learning Environments, and the Future of Learning Management Systems. EDUCAUSE Centre for Applied research. *Research Bulletin, 13*, 1-13.

Sclater, N. (2020). E-Learning in the cloud. *International Journal of Virtual and Personal Learning Environments, 1*(1), 10–19.

Shayan, J., Azarnik, A., Chuprat, S., Karamizadeh, S., & Alizadeh, M. (2019). Identifying Benefits and Risks Associated with Utilizing Cloud Computing. *The International Journal of Soft Computing and Software Engineering*, *3*(3).

Sony, P., & Jupta, P. E-learning through Cloud Computing: Shaping the Future of Learning for Learner of Tomorrow. In B. Xu (Ed.), 2021 *International conference on information technology and management science (ICITMC 2021) Proceedings,* (pp. 481-488). London: Springer.

Sourya, B. (2021). How can cloud computing help in education? Available at: http://www.cloudtweaks.com/2011/02/how-can-cloud-computinghelp- in-education/#

Stanoevska- Slabeva, K., & and Wozniak, T. (2020). Cloud Basics – An Introduction to Cloud Computing. In K. Stanoevska- Slabeva, T. Wozniak & S. Ristol (Eds.), *Grid and cloud computing: Business perspective on technology and applications.* (Pp.47-61). New York: Springer.

Sultan, N. (2019). Making use of cloud computing for healthcare provision: Opportunities and challenges. *International Journal of Information Management.* [Online]. 34 (2), 177–184. Available at: http://linkinghub.elsevier.com/retrieve/ pii / S0268401213001680

Thomas, L., & Knezek, D. (2018). Information, communication, and educational technology standards for students, teachers, and school leaders. In J. Voogt & G. Knezek (Eds.), *International handbook of information technology in primary and secondary education* (Vol. 20, pp. 333–348). New York, NY: Springer.

Wallace, S. (2021). Qualitative research in education. SAGE publications.

Wang, C., & Chen, X. (2020), Design of Hypervisor-Based Integrated Intrusion Detection System in Cloud Computing

Environment. In W. C. Chu et al. (Eds.) *Intelligent system and applications*. (pp. 972-981). Amsterdam: IOS Press.