

The Effectiveness of Distant Learning On Student Attainment

دراسة عن فاعلية التعلم عن بعد على تحصيل الطلاب

by

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ABSTRACT

The objective of the research is to the effectiveness of distance learning in achieving student attainment during the covid-19 pandemic in applied technology school teachers, to develop the aforementioned work, the use of the different means, and methods, which allowed the collection of information to carry out the study of the proposed variables and thus be able to give the necessary support to the present investigation. This is why the methodology used is quantitative, together with the use of bibliographic and field research. The sample that could be collected in this work amounts to 30 teachers, to which the Questionnaire the Distance Education Learning Environments Survey (Sp-DELES) and also the Academic Performance Survey were applied, such instruments were used for this research. It was possible to obtain real data on the new virtual modality and how it influences the academic performance of the students, in addition to this through the theoretical and scientific foundation, the correlation between virtual learning and academic performance during the Covid pandemic was established. Covid-19 in the students of the first baccalaureate of the Educational Unit "Applied technology school.

Keywords: Distant learning, Academic performance, Virtual environments.

خلاصة

مدارس معلمي عند 19-كوفيد وباء خلال الطلاب تحصيل تحقيق في بعد عن التعلم فعالية قياس هو البحث هذا من الهدف المعلومات بجمع سمحت التي، المختلفة والأساليب الوسائل واستخدام، أعلاه المذكور العمل لتطوير، التطبيقية التكنولوجيا المنهجية أن في السبب هو هذا. التحقيق لهذا اللازم الدعم تقديم على قادرة تكون وبالتالي المقترحة المتغيرات دراسة لإجراء، معلما 30 العمل هذا في جمعها يمكن التي العينة تبلغ. والميدانية البليوغرافية البحوث استخدام جانب إلى، كمية المستخدمة الأدوات هذه استخدام وتم، الأكاديمي الأداء مسح وكذلك (Sp-DELES) بعد عن التعلم بيانات مسح استبيان تطبيق تم حيث الأداء على تأثيرها وكيفية الجديدة الافتراضية الطريقة عن حقيقية بيانات على الحصول الممكن من كان. البحث لهذا والأداء الافتراضي التعلم بين العلاقة إنشاء تم، والعلمي النظري الأساس خلال من ذلك إلى بالإضافة، للطلاب الأكاديمي التطبيقية التكنولوجيا مدرسة" التعليمية المؤسسة في الأولى البكالوريا طلاب لدى 19-كوفيد وباء خلال الأكاديمي

الافتراضية والبيئات، الأكاديمي والأداء، بعد عن التعلم: الرئيسية الكلمات

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Chapter 1 Introduction

1.1. Purpose & Significance of the Study

The COVID-19 pandemic prompted a change, and today's universities largely provide their courses online. The United Nations Children's Fund published a study bolstering this trend and highlighting disparities in access to the resources needed for an ideal distance education (Torun, 2020). Distance education, on the other hand, is more an educational method than a philosophical principle, in Bates's view. Without having to physically meet with a tutor, the student is free to study whenever and wherever suits him or her best (at home, the office, or a designated study area). In the context of distance learning, technology is indispensable. In the past, we only thought about education as it was provided in classrooms. For people who cannot complete their education due to some reasons, who, after a certain age, have difficulty sitting at desks for formal education and studying with students who are much younger than themselves, people who want to continue their education but have limited time due to their work, individuals who want to improve themselves but cannot catch this opportunity for some reasons (Sari and Nayır, 2020). Distance education provides great benefits. Distance Learning; time, space, student speed, etc. In addition to its flexibility in matters, it also provides independence in terms of age.

Several factors influence how much of an impact distance learning has on student achievement. While some research suggests that online courses are just as effective as face-to-face instruction at fostering student learning and academic success, other research suggests otherwise (Mandasari, 2020). Student interest and motivation are important aspects of successful distant education. Some students may need more help and advice from their teachers if they are having trouble with the self-directed learning that is necessary for success in distance learning. Students'

motivation and involvement can also suffer if they feel cut off from their classmates and teachers (Nadeak, 2020). It is crucial to take into account the individual needs and circumstances of each student when deciding whether or not distance learning is the most appropriate mode of instruction for them (Hammerstein et al., 2021). This study evaluates postulates, concepts, and ways of seeing the subject to give value to this area of knowledge, and it is theoretically justified by looking at the contribution to knowledge regarding education in the virtual modality and its impact on the academic performance of students (Rozal et al., 2021).

1.2. Scope & Context of the Study

Societies need to put forwards an effective and pioneering approach in all areas if they are to continue to exist. Growth in the military, government, culture, or economy, while necessary, is insufficient. Together, these factors must grow, mature, and find expression in output. In this regard, cultures that can generate new information have an advantage. The level of education of a society's citizens has a direct bearing on that country's capacity to generate new knowledge. The only way for individuals to aid in the creation of social knowledge is for them to continually expand and update their own body of knowledge. The need of continuing one's education beyond the initial formal schooling becomes more apparent in this context as well.

The advent and widespread use of the printing press sparked a technological revolution in education, allowing many people to learn from authors they'd never met, no matter how far away they may be. No one can deny the printing press's importance to society because of the new learning methods it introduced. This method is supported by the fact that textbooks are still widely used in today's classrooms.

Education in the 21st century has brought about a transformation in the teaching-learning process, since traditionally the teacher played an active role in teaching, limiting

himself to giving master classes without taking into account the starting point and the needs of the students. Nowadays, the knowledge and information society increasingly expands its paradigm in the digital world where educational, labor, communicational, and technological transformations are actively evolving (Yeh et al., 2019). Thanks to these changes, society promotes a digital culture by expanding knowledge without geographical limits, implementing educational modalities such as virtual - distance, etc. (Dorn et al., 2020).

The new generation of students has emerged as a consequence of the substantial transformations in the environment of globalization, technological evolution, and social development. This generation is differentiated by the term known as digital natives, which establish cultural, social, and technological diversity within them, immersed in full digital development, dependent and immature people with a unique ability to obtain immediate information (Halasa et al., 2020).

The perspective of this research offers an argumentative and structured approach to university students immersed in virtual education, where academic performance depends on the organized development of teachers and the establishment of adequate strategies and resources that enhance and ensure educational quality. At present, educational effectiveness depends a lot on the admission of a student to an educational institution, which is why its beginnings are marked by experiences and knowledge that adapt and shape student autonomy for the future. Halsas et al. in their article called "Autonomy, the Purpose of Education" considers three academic propositions:

1. Education is the ideal vehicle for the exercise of human freedom.
2. Education at school has as its ultimate goal the development of student autonomy.

3. Education at the university level has as its ultimate goal that the student can make constructive and creative use of his autonomy.

On the other hand, these three previous propositions establish a single purpose, in which the current student can maintain his autonomy as he develops his abilities and skills. A detailed explicit observation of these three points begins. First, education itself is the fusion of knowledge and strategies through which the new generations are helped in the development and improvement of intellectual faculties. Generalizing, at the primary level pedagogical methods delicately perfect the purposes of the learning process. Current students under the range of information, technology, and social development have a window to autonomous knowledge and therefore efficient academic performance.

The university section is designed for the student to learn and self-evaluate their daily development. On the contrary, the university is not designed so that the student is imposed on him, but rather so that he learns in a self-taught way. Then, the teachers are in charge of guiding the learning, to developing the skills and abilities which the student addresses, for this together with the superiors, the teacher must promote a fertile and comfortable environment in which the student body analyzes, creates, build, run, develop and integrate.

1.3. Research Objectives

1. To determine the academic achievements of the students attending the distance education.
2. To determine the difference faced by students in distant learning.
3. To determine different online methods and platforms that help in the distant learning of students.

1.4. General definitions

Internet: The Internet, which is an electronic communication network formed by connecting computers with fast-developing technology through a network system, has now been used very frequently in educational environments. It is the world's largest electronic communication network formed by connecting computers. This communication network is also the world's largest data bank (Goumagias et al., 2021). Thanks to these networks, individuals can have mutual conversations and meetings with each other, and communicate quickly. They can present their information sources to other people. The internet was very difficult to use in its development stages. Thanks to new technologies and software that supports this technology, besides accessing the desired information easily on the internet, shopping, bill payments, and exam applications can also be made.

Distance Learning: It refers to an education system model in which students and teachers in different environments carry out their learning and teaching activities with communication technologies and postal services (Bozkurt, 2019). It is a planned learning that normally consists of teaching activities in different environments, in which electronic or non-

electronic systems are used, special communication methods, as well as special organization and practices, as well as a special lesson planning technique, and special teaching techniques.

It can be said that distance education is the type of education that is received without going to an educational institution, without communicating with the teacher, through letters, written lecture notes, CDs, videotapes, television, or the internet. Today, education and training activities are classified as formal education, non-formal education, and distance education.

Internet-Based Distance Education: It is the education given by using all kinds of the Internet (web, e-mail, discussion groups, message boards, chat programs, teleconference) facilities to provide distance education in case teachers and students are not geographically in the same environment (Mittelmeier et al., 2021).

Simultaneous Distance Education: Known as online or synchronous training, this model is usually implemented as multiplexing of a lecture session. In this model, information is made available to the target audience as soon as it is produced (Mittelmeier et al., 2021).

Chapter 2 Literature Review

2.1. Definition of Distance Education

It is no longer important for the teacher to memorize the information exactly to the student. It has become obligatory for the teacher to give the information to the student at the stages of comprehension, analysis, synthesis, and evaluation, not at the level of knowledge, and the student should be the person who uses this knowledge, evaluates, thinks, and produces thoughts. Today's world, which we describe as an information society, is rapidly becoming globalized and reshaped (Goumagias et al., 2021). This situation also changes the qualifications and educational understanding of the teacher and the student he/she trains.

Education is to educate individuals in line with the changing needs of society. For this reason, it is a fact that every society desires to educate students who adapt to the information age and technologies and tries to organize their education policies accordingly. Education is to help individuals reach information by providing society with the necessary tools to access information. The development of a country increases with the increase in the number of educated individuals (Clark, 2020).

Education is an important indicator of social development and an important part of daily life. In a century when lifelong learning is indispensable, in parallel with the rapid-intensive social, economic, and technological developments in the world, it is among the most important social policies of countries to provide suitable conditions for individuals who cannot continue their education due to reasons such as physical and time inadequacy, and to eliminate the inequality of opportunity in education takes.

Rapid population growth and other factors necessitated the structural re-planning of the US Education system. All educators, education administrators, and, academicians also believe

in the necessity of re-planning in education. Structural changes have occurred continuously within the US education system.

In addition, the education specialist also states that thanks to information technologies, the number of audiences reached by the curriculum will increase, in other words, equality of opportunity in education will be provided (Kara et al., 2019). To meet their educational needs, countries take various initiatives such as training teachers, opening schools, using educational institutions and equipment effectively, and extending learning periods. Although these traditional initiatives provided a significant increase in educational opportunities, they remained far from meeting the needs due to the insufficient resources allocated to education as a result of the economic crisis that exists all over the world. This situation has led countries to new searches in education.

Countries have moved beyond traditional educational structures and concentrated their efforts on finding ways to provide better and cheaper education to more people. As a result of these efforts, the distance education approach, which is a new approach in education, has been developed. One of the reasons for the emergence of the distance education system is the search in the education system. “The most basic purpose of the distance education system is to make education service widespread, to save education from the monopoly of certain social groups, and to ensure that all individuals benefit” (Simonson, Zvacek, and Smaldino, 2019).

Today, it is seen that distance education tries to realize some other objectives besides the main objective of equality of opportunity. Sakar summarizes these aims as follows; Enabling all individuals in society to benefit from educational opportunities throughout their lives, ensuring that education is used for individual and social purposes, and ensuring that education reaches a very large audience by exceeding the geographical limits of education

with the media to be used for education, and also to create “equality of opportunity” in education by reducing the high costs created by traditional education (Sari and Nayır, 2020).

The term distance education was first used in the catalog of the University of Wisconsin in 1892, and William Light, the director of the same university, used this term in an article in 1906. Some definitions of distance education, which are named in different ways, are as follows:

2.1.1 Distance Education: It is a form of education made from a certain center by using various communication tools without being face-to-face between the student and the teacher. It is a method of teaching from a specific center through specially prepared teaching units and various environments where there is no opportunity to carry out in-class activities due to the limitations of traditional learning-teaching methods, communication, and interaction between the planners of educational activities and students.

Distance education is an education model in which teachers, students, or students are physically separated from each other and most benefit from technology instead of face-to-face communication (Bozkurt, 2019). “Distance Education: It can be defined as a learning-teaching activity where teachers and students are in different places without time and place limitations,” (Aıç1, 2010). “Distance Education: It refers to an education system model in which students and teachers in different environments carry out their learning-teaching activities with communication technologies and postal services.” (Williamson, Eynon, and Potter, 2020).

In the definition made by the California Distance Learning Project (CDLP 2004) regarding distance education, it is stated that distance education is an education system that is carried out by establishing a connection between the student and educational resources. It is underlined that there is an increasing situation. Another aspect of the distance education

program is that it has to follow the developing technology closely by making use of the available resources (CDLP, 2004).

The definition of the United States Distance Learning Association (USDLA 2004) is as follows: "Distance education is the delivery of education to distant students with the help of tools such as satellite, video, sound, graphics, computer, multimedia technology. USDLA means that the teacher and the student are geographically far from each other. He underlines that electronic tools or written and printed materials should be used in this education program. Distance education consists of two main parts: teaching that includes teachers and learning that includes students." With this definition, Bates also says that there are differences between flexible learning, distance education, and open learning mentioned above.

2.2. Why Distance Education

Distance Education can appeal to a wide range of students.

Distance Learning minimizes the boundaries of education in terms of space, unlimited in terms of time, and cost in terms of cost. Individuals who have experienced various limitations to receive education have gotten rid of limitations by choosing distance education today. Thus, a large mass of students started to benefit from this education service with distance education.

2.2.1 Distance Education is Student-Centered

Both the purpose of the emergence of distance education and all its applications are the main indicators that distance education offers a student-centered education. After all; even the fact that it is a practice that has emerged to enable people who cannot receive formal education for some reason to receive education; In this respect, it shows that it is a system that puts the student at its center (Goumagias et al., 2021).

In formal education, every student cannot expect to receive an education according to his/her level, learning speed, and learning style. Considering the conditions of today's universities and the number of students, the instructors' ability to adapt to the learning speed and it does not seem possible for them to develop appropriate teaching methods. In this respect, distance education can be said to be student-centered. Students can choose a distance education system suitable for their learning speed and style and receive their education (Kara et al., 2019). Considering its independence from time and place, the diversity of distance education technologies and methods used, and all these factors aiming to reach all kinds of students. We can say that distance education is a student-centered system.

2.2.2 Distance Education Provides Flexibility in Time and Space

In distance education applications, There are both simultaneous (synchronous) applications and separate time (asynchronous) applications. Students; If it is suitable for their program or if they choose according to their wishes, they can participate in mutual and simultaneous training. Other than such applications, distance education applications are; take place independently of time (Williamson, Eynon, and Potter, 2020). For example; from lectures recorded in video form, presented as written material on the web.

Students can benefit from courses and educational software whenever they want. It should not be thought that education can only be carried out in an environment where the instructor and the student are physically close to each other, for example, in the same classroom environment. Flexibility in terms of space, as seen in the name of “distance education” (Sadeghi, 2019). The student can take the lesson from the distance they want. In some systems, the factor of independence from time and space disappears during the evaluation phase. To make the evaluation healthier. Students' learning levels are measured in

the date, time, and place reported during the exam periods. From this point; We can say that as there are systems that are independent of time and space, they also provide flexibility in terms of time and space for distance education.

2.2.3 More People Can Study with Less Budget

Distance Learning: In this respect, it is different from formal education, which requires campus life and can create major economic problems. Distance Learning; getting rid of many economic reasons such as transportation, food, accommodation, and inability to work in any job; It provides the opportunity to continue education in line with the desired time and conditions. Thanks to the training made over the Internet, both the cost of posting is eliminated and the distribution of information, printing, and transportation costs can be done over the Internet with zero (Hebebcı, Bertiz, and Alan, 2020).

2.3. Advantages of Distance Education

Many educators question whether distance learners learn as well as face-to-face learners. Research results have shown that distance education is as successful as face-to-face education as long as the right method and technology are used, as long as communication between students is ensured and it is directed from teacher to student (Sadeghi, 2019). Standardization provides standardization of education. With distance education, education that changes from teacher to teacher has become standard. The same education has provided a standard by offering the same quality of education to everyone, everywhere. Time reduces the time spent in training units. Distance education minimizes the loss of time by providing opportunities for individuals who have to work and therefore cannot continue their education and who want to improve themselves.

Cost reduces the cost of on-board training and the travel expenses spent for training (Purwanto, 2020). Since the obligation to be in the same place in formal education is not in distance education, it reduces the cost for the learner. Ease ensures that training can be given when and where it is needed. Learning when the student feels ready to learn and when he/she needs it ensures that the learning is permanent. Versatility provides tailored, task-specific training. Distance education can be tailored to the needs and given specifically to the task so that employees can receive in-service training at any time. It reduces the time gap between training and real-life applications. Time losses in the classroom environment in formal education are minimized by distance education.

Flexibility, in unexpected situations, provides training opportunities according to the needs. Through communication, students give their feedback easily. Feedback can be given more easily through a forum or a chat environment. Discipline in the classroom environment and students' hesitations in expressing themselves are minimized through forums. Thus, students can express themselves most comfortably (Purwanto, 2020).

Interaction between teachers and learners is provided by various teaching techniques such as text and graphic communication. Since more teaching techniques are used than the teaching methods used in formal education, learning becomes permanent. Since all disabled and unhealthy people can receive education, equality among the people is ensured. Schools in rural areas are also provided with the opportunity to benefit from these opportunities. It provides equal opportunity in education. Distance education is an equal opportunity for people with disabilities and those who live far from school.

2.4. Limitations and Disadvantages of Distance Education

Some aspects sometimes hinder and sometimes reduce the efficiency and implementation of distance education. Their detection allows us to get results while developing applications. It is thought that the constrained aspects will be eliminated with the emergence of new technologies (Clark, 2020). The development of behaviors is caused by not getting immediate help and not resolving the problem. Not being able to get help when the student needs it and not solving their problems reflects negatively on their behavior.

Distance education creates a disadvantage for individuals who are not motivated to learn, do not have the habit of self-study, or have not developed this habit (Bozkurt, 2019). The obligation of working individuals is to study in the time they will spare for themselves. Persons who are obliged to leave formal education and work, are obliged to study not when they want, but when they are left from work.

Limitations in communication due to the large number of students, where and when the internet infrastructure is not strong, there may be communication difficulties. Problems experienced by individuals who are unfamiliar with technology. People who are not computer literate may have problems with internet-supported distance education (Mittelmeier et al., 2021). Difficulty in planning, and coordination: Distance education is difficult to plan and deliver simultaneously.

2.5. How to Provide Distance Education

Distance education can be given with a wide variety of alternatives. However, these are grouped into four main groups: sound, image, data, and text. Sound: Digital data recorded as audio files are transmitted via broadcast. Telephone, video conferencing, and radio can be listed as audio materials. Tape and radio, on the other hand, are passive, that is, one-way audio tools. Image: Pre-recorded images are delivered to learners via television or by broadcasting

live. Slides, moving images (film and videotape), and real-time images combined with sound can be given as examples of instructional video tools.

Data: Computers carry information electronically. Therefore, the data word represents this group, which is widely used as an instructional tool. Computer applications used for distance education show a wide variety. Those that are used to present lessons to students for specific and specific purposes are called computer-assisted instruction CAI (Computer-assisted instruction) (Romanyshyn et al., 2019). Those used to store and organize student records and achievements are called computer-managed learning or CMI (Computer-managed instruction). In this system, CAI and CMI are used together, as there is no obligation to teach via computer. Those used to facilitate communication (e-mail, computer conferencing, and www) are called computer-mediated communication CME (Computer-mediated education).

Writing: Printed resources constitute the main element of distance education programs. These printed resources provide the basis for other technological tools. Textbooks, workbooks, lesson plans, and supplementary books are examples of printed resource types.

2.6. Effective Distance Education

To be able to conduct effective distance education, first of all, a team must plan, determine the objectives of the lessons, and carefully prepare internet technologies and tools to realize these target behaviors. It is also very important that the course is given over the Internet simultaneously or asynchronously. To ensure the effectiveness of distance education, the main points are which methods will be used in the design of the program, and whether the methods to be used are supported by internet technologies, technical, resource, and teacher support (Mittelmeier et al., 2021). In addition, serious cooperation is needed from system developers, faculty members, assistants, students, and administrators to ensure this effectiveness.

2.7. Reasons for the Development of Distance Education

This situation and needs encourage the development of concepts and practices in the field of education such as distance education, open education, independent learning, programmed learning, learning based on environments, individual education, mass education, continuous education, alternate education, lifelong education, open university, and similar practices. Scientific and technological developments, the increase in the demand for education, cost, effectiveness, and efficiency are the reasons for the development of distance education (Sari and Nayır, 2020). Distance Education, with its feature of being a form of education where the learner and the teacher are physically far from each other, provides the opportunity to learn at any age, place, time, and speed.

2.8. Academic performance

Academic performance in university students is one of the necessary parameters to address educational quality, all of which are linked to basic precepts such as efficiency and excellence. The causes of low academic performance are very varied to such an extent that the investigations that study various factors on this problem and, scarcely, are studies that manage to bring together all the variables or associated components.

El Said (2021) mentions that students with low academic performance have two main difficulties: they do not know how to study and they do not know how to learn. For this reason, the teacher must focus her work on improving the learning abilities of the students.

Academic performance depends on the knowledge that the student has been acquiring throughout their training process, it can also be defined with all those capacities that we have

acquired through our academic life and they are activities that can be measured qualitatively. as quantitative (Lozano & Fernández, 2020).

2.8.1. School performance

School performance synthesizes the actions of the educational process since it is not based only on grades, but also on cognitive aspects that he manages to develop, among these aspects are abilities, attitudes, skills, ideas, and interests. School performance stands out as that system that measures achievement and the construction of knowledge, this knowledge is established through interventions and educational strategies which are valued through qualitative and quantitative methods in each of the subjects (León, 2020).

2.8.2. Factors

The effectiveness of a student's academic performance will be due to various factors:
External factors: These may be the classroom environment, the teacher's methodology, the educational program used by the institution, and family relations.

Internal factors: These can be the motivation, attitude, personality, and self-concept that the student has throughout the class (González & Chasin, 2020).

2.8.3. Low performance

The factors that intervene in low academic performance can be the change from one institution to another, psychological factors of the student, catastrophic illnesses, lack of motivation in the classroom, conflictive family contexts, lack of interest on the part of the student, bullying, and not paying attention. to the classes taught, lack of concern on the part of the teacher towards the students, not sleeping well, and not having the necessary materials to carry out the academic tasks imposed by the teachers (Castillo, 2020).

2.8.4. Characteristics of academic performance

Academic performance is linked to quality measures and value judgments. The performance in its dynamic aspect responds to the teaching and learning process which is linked to the ability and effort made by the student. Understanding a static aspect of the product of learning generated by the student and expressing the behavior of users. Performance is a means and not an end in itself. Performance is often related to ethical purposes, which include economic expectations based on the current social model (Cisneros, 2020).

2.8.5. Academic performance classification

Individual performance: It manifests the acquisition of knowledge, skills, attitudes, and aspirations, which will allow the teacher to make subsequent pedagogical decisions, that is, it is supported by the exploration of knowledge and cultural habits, both in cognitive and intellectual fields, as well as aspects of personality (Castillo, 2020). General performance: They manifest while the student goes to the educational institution, that is, it is from the learning of educational lines of action and cultural habits as well as in the student's behavior (González & Chasin, 2020).

Specific performance: Gives the resolution of the personal problems of the student as well as his development in professional, social, and family life which will manifest in the future of the student this performance will be done from a much easier perspective How is the evaluation that is to say the conduct of their relationships with their teacher, with themselves, with their daily life and with others should be considered (Lozano & Fernández, 2020).

2.9. Virtual platforms

They can be defined as a vast range of applications and technological tools that aim to improve and facilitate the teaching-learning process both for teachers and students through creating, preparing, managing, administering, and distributing virtual classes through the use of digital platforms (Larripa, 2016). Virtual platforms are the perfect complement that helps improve the quality of teaching for students since there is no time limit for accessing them and they can be used 24 hours a day. The virtual platforms are oriented to be used from the basic cycles to the higher education cycle, which is why virtual platforms have taken a fundamental role when imparting new knowledge to students (Cisneros, 2020).

2.9.1. Operation of virtual platforms

They work in a very simple way since the software is easy to use, each of the participants has a different role between them: they are the administrator, the creator of the course, the teacher in charge of teaching the subjects, and the student who will be in charge of developing the activities that are in it (Argandoña, García, & Barcia, 2020).

2.9.2. Benefits of virtual environments

Virtual environments establish a diversity of benefits, offer dynamic content and encourage an active attitude on the part of the student since they do not work passively but actively throughout their academic training. They are fundamentally characterized by interactivity, forums, and chats. Among them are: Classrooms without walls: They are virtual social spaces that seek interaction between the various users, seeking a better teaching-learning process (González & Chasin, 2020).

2.9.3. Necessary Components in virtual learning

To create an interactive environment within the virtual modality, it is necessary that the people in charge of the teaching-learning process, in this case, the teachers, are prepared and trained to plan and teach their classes in a proactive, didactic, and flexible way, through the use of ICTs (Arroyo, Fernandez, & Barreto, 2018). According to (Duarte, 2019) various components must be addressed to effectively implement virtual learning, among them are:

2.10. Technical components

A stable internet connection must be available, both for teachers and students. It is impossible to want to organize a virtual learning process if you do not have a permanent internet connection or with insufficient accessibility or speed. Virtual classrooms, that is, a website where you can upload and store the teaching materials used throughout the academic period. A main virtual platform that serves to inform about the calendar of activities such as evaluations, homework, etc. That is a website in which teachers and students exchange both personal and pedagogical information necessary for the development of the teaching-learning process. Institutional email or personal email of the teacher and students. In the online classroom mode, you can use various virtual platforms such as Gmail, Skype, OneDrive, Classroom, Moodle, etc.

2.10.1. Pedagogical components

Academic regulations or protocol informs the rules, conditions, and enrollment requirements for access to the course in which students enroll. Curricular and academic data of each of the teachers must be included in the virtual classrooms so that students can review them. Program of each one of the courses. Each course must have its defined planning (objectives, teaching techniques, evaluation requirements, deadlines, requirements, contents,

evaluation procedures, and required bibliography). Calendar of activities to be carried out. List all the virtual books that will be used throughout the academic period. Virtual classrooms for each subject.

2.11. Virtual education

Education over time has had its problems, with the arrival of the internet the virtual modality addresses how students and teachers make commitments for their teaching and learning. With time, different pedagogical models have emerged that have different properties and different points of view. In education, many substantial changes have been generated over the years, but despite these changes, face-to-face education continues to be one of the most active modalities, but with a deficiency that in many cases is equal deficiencies for both teachers and students, which generates that the changes cannot be carried out. That is why it is necessary as part of the teaching staff to make personal changes, to look for strategies so that the student absorbs the knowledge that the teacher is imparting.

Shoraevna et al. point out, "In an educational environment, ICTs can provide an environment of teaching and learning for students and teachers, (...) eliminate space-time barriers, facilitate collaborative work and self-learning, and enhance interactivity and flexibility in learning" (Shoraevna et al., 2021); enabling innovation in education that necessarily leads teachers to be trained and that educational processes are increasingly solid (p. 20).

The use of ICT is very important for teaching and learning, allowing innovation in the pedagogical activity, which is a decisive factor in the academic improvement of students. This cannot fail to recognize the fundamental role of the teacher, who must also be an agent of change, and to achieve this it is necessary to be prepared for the technological demands of our

times together with teaching skills; which are based on a person capable of developing in the digital age and thus understanding the ability to use technological tools in the virtual modality.

2.11.1. Virtual Universities

Universities that provide education and training only in the virtual environment, except for traditional universities, are called virtual universities. While it is difficult for some groups to accept even distance education, it seems difficult to establish virtual universities in our country. Making something virtual means discovering its importance and then recreating it with new content without losing its old power. So, creating an efficient virtual university means discovering the power sources of a real university and then recreating it in an electronic environment (Shoraevna et al., 2021).

Education is the first part of the work and constitutes the infrastructure of management. Currently, it is possible to encounter virtual universities that have provided the “student union” in various ways (chat rooms, visiting areas, libraries, and game rooms where you can buy anything you want). Only a few have virtual consultants online. In these virtual universities, students also post on bulletin boards where they can monitor community activities and get other important information. At this rate, picture galleries and other cultural events will be able to be brought online in the future. By running all these components together, a strong learning experience can be created in the corporate environment. Thus, a virtual university not only provides information but also provides us with information about corporate culture and social culture. When the functioning of existing virtual universities is examined, it can be seen how a solid virtual university is. The fastest use of communication technologies in education systems is in the USA. America, which has a history of more than a century in distance education, now draws the attention of all countries with its virtual applications (Sadeghi, 2019).

2.12. Academic performance based on training received in virtual environments

After the outbreak of Covid-19, schools worldwide opted for the massive closure of educational centers in person, since it was necessary to reduce social contact and contain the spread of the new virus. To mitigate the negative consequences of the abrupt closure of educational institutions, most countries opted to implement the virtual modality, that is, studying from home, and providing purely online classes for their students, which has been developed through the use of the ICTs (Montenegro & Fernández, 2017).

The virtual classrooms went from being a complementary support in face-to-face classes to being the most essential when providing a solution to the problems that arose from the health emergency and thus being able to continue the educational process of each student worldwide (Bravo & Rodriguez, 2020).

2.12.1. Use of virtual platforms in education

The virtual platforms in distance education have become one of the most important parts when we talk about educational processes since at present, they have become one of the most essential tools when interacting since they are easily accessible and facilitate communication between teachers and students (Meriño, Lorente, & Maribona, 2020).

According to (Barrera & Guapi, 2018) for education to develop effectively through virtual media, the following points must be considered:

Focus on a comprehensive education where students become the center of learning. Education must be aimed at controlling the cognitive, academic, and affective areas of each of the students. The student becomes the protagonist and the teacher his guide. Academic, scientific, and personal challenges must be established so that the student can self-instruct.

Teachers must meet the needs of their students when motivating and guiding them in their learning process. Teachers must train and focus on education so that students can develop in their daily lives.

Virtual platforms should help train students in the following dimensions:

- a) In context: the student must be aware and coherent of the social reality.
- b) In experience: there must be an educational relevance and an institutional pedagogy.
- c) In reflection: where the experience and a pedagogical foundation are developed.
- d) In action: The main foundation is know-how.
- e) Under evaluation: There must be a central and permanent process that measures quality frequently (Rosales, 2020).

2.12.2. Platforms Used in Distance Education

There are two types of distance learning:

a) Synchronous (Simultaneous) Distance Education

Learning-teaching activity is an application in which the communication between the student and the teacher is two-way. Regarding this; There are three models: the two-way teleconference model, the two-way TV, and the two-way internet-based conference. In the system, students and teachers can make teleconferences with each other over the Internet (He et al., 2021).

b) Asynchronous (Asynchronous) Distance Education

Examples of this model are letter teaching, radio, television, and one-way internet. In this model, teachers present information about their courses to their students on web-based

pages. Students can take and study this information whenever they want. In this model, it is sufficient for users to have internet access (He et al., 2021).

2.12.3. Tools Used in Distance Education

2.12.3.1. Servers

Database servers, web servers, wap servers, sms servers, and e-mail servers are used in distance education. The installation of the programs is carried out by a technical team and the desired educational environment can be provided.

2.12.3.2. Mobile Phones

Today, 4G compatible smartphones can be purchased for an average of 400 TL, and when necessary programs are installed on these phones, e-mails can be accessed when adjustments are made. In addition to the growing screen sizes, the fact that the internet access speed is not the same everywhere and it is still quite expensive is a problem (Purwanto, 2020).

2.12.3.3. Pocket PCs PDA Handheld PCs

Personnel Digital Assistant is expressed as Personal Digital Assistant in the US. PDA is the general name given to all of the machines we call handheld computers. The first PDAs were data banks that most of us are familiar with. The concept of PDA began to enter the literature with Apple's product called MessagePad in 1993 and Casio company's data bank named Cassiopea with 1 Mb memory in the same years. However, the real development took place in 1996 with the product called Palm Pilot, which was launched by Palm company. The Firm, in which Palm used this first product, brought a software standard to the concept of PDA with its OS operating system. With new products developed in a short time, PDAs spread rapidly around the world (Purwanto, 2020). Today, pocket computers have left their place for

smartphones. The use of pocket computers is not so common anymore and people generally tend to buy laptops, tablets, and smartphones.

2.12.3.4. Tablet PCs

Tablet computers, tablet computer models that allow wireless internet access thanks to their small size, lightness, ease of transport, and Wi-Fi technology, bring great convenience to social life, especially to people who constantly travel for work. In addition to watching movies, you can play games, listen to music, and follow courses in distance education with a Tablet PC. These computers are generally used by those who spend a lot of time on social media platforms, as well as for doing homework in distance education. Today's tablet computers mostly use Android and iOS operating systems. Android operating system, an open source operating system has made great progress in a short time and has become widespread with great interest.

2.12.3.5. Laptops

Laptops today, called laptops, have more features than most desktop computers. It is indisputable that it can be used in distance education, thanks to its portability and ease of connecting to the Internet from almost anywhere with the extra hardware installed. However, heavy laptops and low battery life are still major problems. In this context, it is thought that pocket computers will play an important role in internet-based distance education. It is thought that the widespread use of pocket computers, which is the most important device of distance education, and the increase in the software to be developed for them will support internet-based distance education (Purwanto, 2020).

2.12.3.6. Dynamic Website

A dynamic website can be created specifically for each user or each visit. When an individual user in the world enters a site with his username, he can access different content from other users. This different content may be the colors of the website, the theme, the music, the degree of authority on the site, etc. can be sorted. Popular websites today are dynamic sites. ASP.Net, ASP, PHP, JSP, and CFM software languages are used to create this dynamic. These software languages ensure that the pages can be constantly updated by the creator or the visitor. ASP.Net and ASP software languages developed by Microsoft are accepted and used by a certain group, and the programming language known as PHP and perhaps the most used programming language is widely used today.

Real-time data flow languages such as JavaScript, JQuery, Flash, and Silverlight are also used to help these software languages used for the dynamism of the content on the pages and enable all pages to be used dynamically. At the end of 2007, a new concept called Web 2.0 emerged and the term web 2.0 was used to express the new generation website. Although there is nothing much different in terms of speed and coding; They are sites created with options such as color harmony in appearance, more attractive transitions, oval corners, and the combination of contrasting colors.

A new concept called 0 has emerged and the term web 2.0 has been used to express the new generation website. Although there is nothing much different in terms of speed and coding. They are sites created with options such as color harmony in appearance, more attractive transitions, oval corners, and a combination of contrasting colors. A new concept called 0 has emerged and the term web 2.0 has been used to express the new generation website. Although there is nothing much different in terms of speed and coding (Shoraevna et

al., 2021). They are sites created with options such as color harmony in appearance, more attractive transitions, oval corners, and a combination of contrasting colors. In summary, the dynamic website can be updated quickly and easily, and the ability to update the site without being dependent on the web producer through a panel to access the database, on the web server.

Chapter 3 Methodology

The research methodology is that set of processes and techniques that are used in an investigation, in the same way through this how the data obtained through validation and scientific verification of all the data was analyzed, ordered, and collected was determined. results that were achieved within the study (Gallardo, 2017). The methodological criteria used throughout this study are:

3.1 Research focus

The present investigation was of a quantitative approach, within the qualitative part it was intended to collect, analyze and describe the existing information in various investigations about the variables proposed in this study. That is why it did not focus on numerical aspects, but on its characteristics and definitions, in the quantitative part, it was reflected through the interpretation and analysis of data that was obtained after the application of the survey questionnaires. This research will collect data in the form of questionnaires for teachers at the school.

The levels or types of research that were used in the research project are:

3.1.1. Descriptive

The investigation was of a descriptive type since the main characteristics of a certain event were disclosed, through the search for information about the study phenomenon, in this case, virtual education and its influence on academic performance, through the analysis of the situation faced by first-year high school students during the Covid-19 pandemic (Michelle, 2018).

3.1.2. Correlational

The research was of a correlational type since the relationship between the two variables was detailed: virtual education and its influence on student attainment during the Covid-19 pandemic in first-year high school students belonging to the " Applied Technology School ".

3.2 Investigation modality

Bibliographic research

The present investigation was bibliographic since its purpose was to comply, detect and deepen various approaches, theories, concepts, and various criteria of different authors about the subject of study based on scientific articles, documents, magazines, books, and the Internet (García & Corell, 2020).

3.3 Field research

The present investigation was field since it was carried out in the Educational Unit "San Alfonso", which focused on obtaining precise information according to the objectives set out in the investigation, as well as the application of data collection instruments. information, through the use of semi-structured questionnaires. The Distance Education Learning Environments Survey (Sp-DELES) questionnaire for the independent variable and a survey was validated using Cronbach's alpha for the dependent variable through virtual resources such as Google Forms (Lozano & Fernández, 2020).

3.4. Population and sample

The universe that was considered for the present investigation was made up of the teachers of the first baccalaureate of the morning section of the Applied Technology School. Since the population was small, the calculation of the sample was avoided.

3.5. Data collection plan

Basic questions	Explanation
So that?	To meet the objectives set out in the Investigation
What population?	First-year high school teachers of the Applied Technology School
On what aspects?	Distant learning and student attainment during the covid-19 pandemic
who will collect	Researcher: XYZ
When?	Academic period September 2020-June 2021
Where?	Educational Unit "Applied technology school"
How often?	Once
What technique?	Survey
With what instruments?	Questionnaire

3.6. Information collection techniques

Information-gathering techniques and instruments are those procedures and tools that help the researcher not have to collect and analyze information data. For the elaboration and collection of information in the present investigation, we worked with the survey technique through a semi-structured questionnaire to obtain direct information from the subjects that are part of the study. For this reason, the questionnaire The Distance Education Learning Environments Survey (Sp-DELES) was applied for the dependent variable. This survey

allowed us to identify the degree of satisfaction of first-year high school teachers about the training received in virtual environments. For the dependent variable, a survey validated by Cronbach's alpha was used, which allowed evaluation of the level of student attainment after the implementation of distance learning in first-year high school teachers of the "Applied Technology School" Educational Unit.

3.7. Material to be used in the dependent variable (Academic Performance)

Semi-structured questionnaire (Survey) to measure student attainment.

About the instrument that was used in the dependent variable (student attainment), a semi-structured questionnaire consisting of 27 items with Likert-type polytomous response options was prepared.

This instrument was validated with Cronbach's alpha with a score of 0.87. Which served to evaluate the level of academic performance after the implementation of virtual education.

To qualify this scale, a scale was made, which was assessed as follows based on the responses of the 30 students: Appropriate (30-20) Indicates that the student agrees with the information found in the survey. Good (19-10) Indicates that the student agrees with the information found in the survey. Inappropriate (Less than 10) Indicates that the student strongly disagrees with the information found in the survey. The questionnaire was based on a scientific theoretical foundation consulted in different repositories and research sources. In this way, the level of student attainment of first-year high school students was evidenced.

3.8. Hypothesis

Does virtual education influence academic performance during the covid-19 pandemic in first-year high school teachers of the " Applied technology school " Educational Unit?

True Hypothesis (H1)

Distant learning SI influences academic performance during the covid-19 pandemic in first-year high school teachers of the "Applied technology school" Educational Unit.

Null Hypothesis (HO)

Distant learning does NOT influence student attainment during the covid-19 pandemic in first-year high school teachers of the "Applied Technology School" Educational Unit.

3.9. Validity and Reliability

The instruments applied in this research were selected and developed taking into account the level of relevance and relationship they have with each of the variables raised in this research. The questionnaire and the survey provided reliable information to comply with the dependent variable of academic performance and independent virtual education, which was effectively adapted to the population selected for this study. The data processing was carried out through the SPSS program, and the sample was used for the analysis of results thus, later, the interpretation of the results was achieved.

3.10. Processing and analysis

We proceeded to collect information from the two evaluation instruments, the independent variable virtual education was obtained with The Distance Education Learning Environments Survey (Sp-DELES) Questionnaire and the dependent variable academic performance was obtained with the Academic Performance Survey, which helped determine the incidence of virtual education on academic performance during the Covid-19 pandemic in first-year high school students of the "Applied Technology School" Educational Unit.

With the data obtained, a correlational study of the virtual education and academic performance variables was carried out with a margin of error of 0.05. through the use of

Kendall's Tau. With the information obtained, the respective interpretation and analysis was carried out regarding the existing problems in the population studied, the computer system that was used was SPSS. The survey questions included:

- a. How effective do you think distance learning has been in helping your students achieve their academic goals?
- b. What are the main challenges you have encountered when teaching students through distance learning?
- c. Do you think distant learning has negatively impacted student motivation and engagement?
- d. In your opinion, what measures can be taken to improve distance learning and its impact on student attainment?

Chapter 4 Results and Data Analysis

The current chapter focuses on the results and the analysis of the results.

Section 1: Terms and conditions to proceed.

Do you agree to complete this survey?

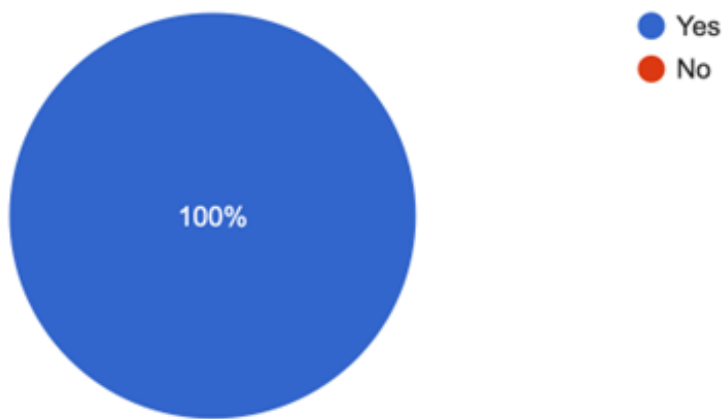


Figure 1: Do you agree to complete this survey?

From the above graph, it can be seen that everyone agreed to complete the survey.

How long have you been with this organization?

21 responses

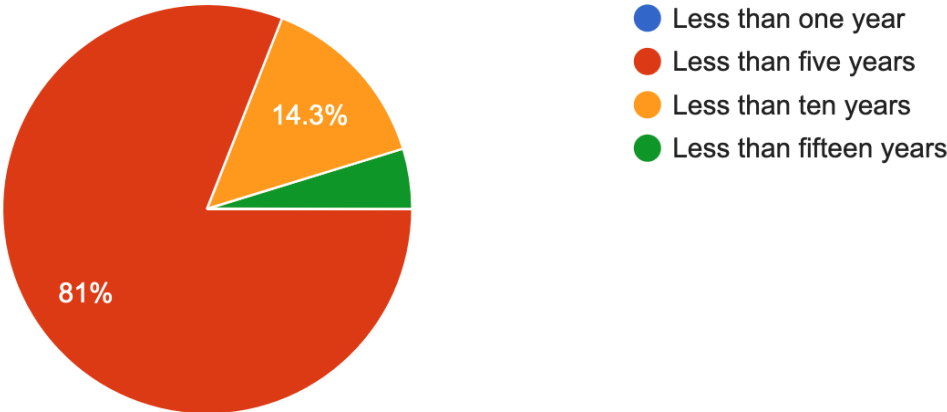


Figure 2: How long have you been with this organization?

From the above image, it can be observed that 81% of people have been working with this organization for less than five years, and 14.3% said that they have been working for less than ten years.

What is your area subject:

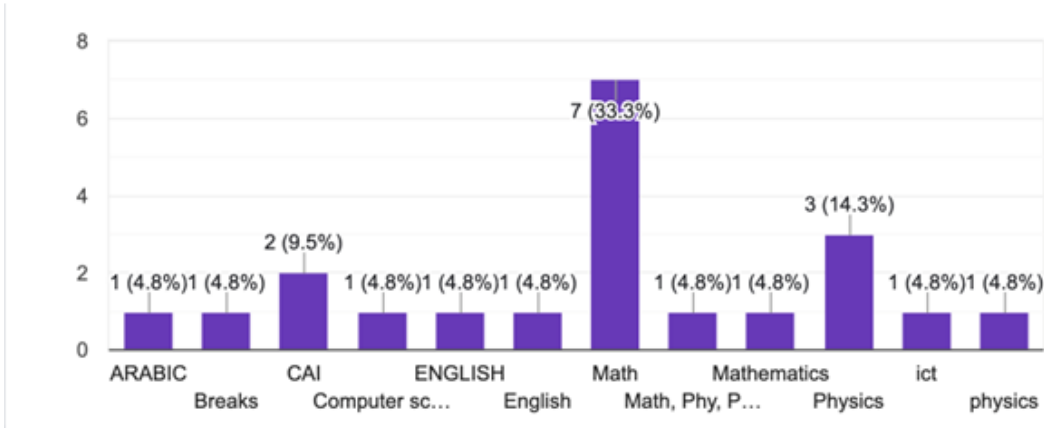


Figure 3: What is your area of subject?

From the above graph, it can be seen that when respondents were asked about the area of the subject, the majority of them i.e., 33.3% said that they are of Math subject area. Whereas 14.3% said that are from the Physics field, and only 2 respondents said that they are from CAI.

How many years you have in this school? (Just write number of years)

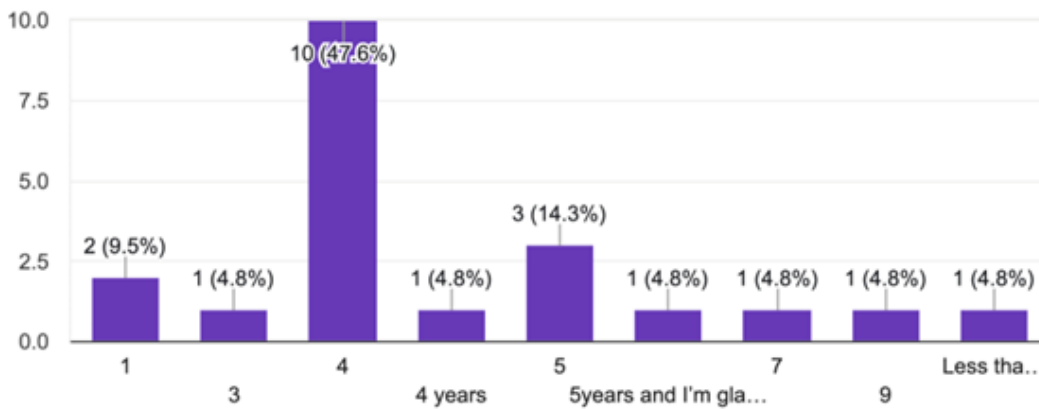


Figure 4: How many years you have been in school?

From the above graph, it can be seen that when respondents were asked about the number of years they served the current school, 47.6% said that they have been serving for four years, 14.3% respondents said they have been serving for five years, two respondents said that they have been serving for one year and less.

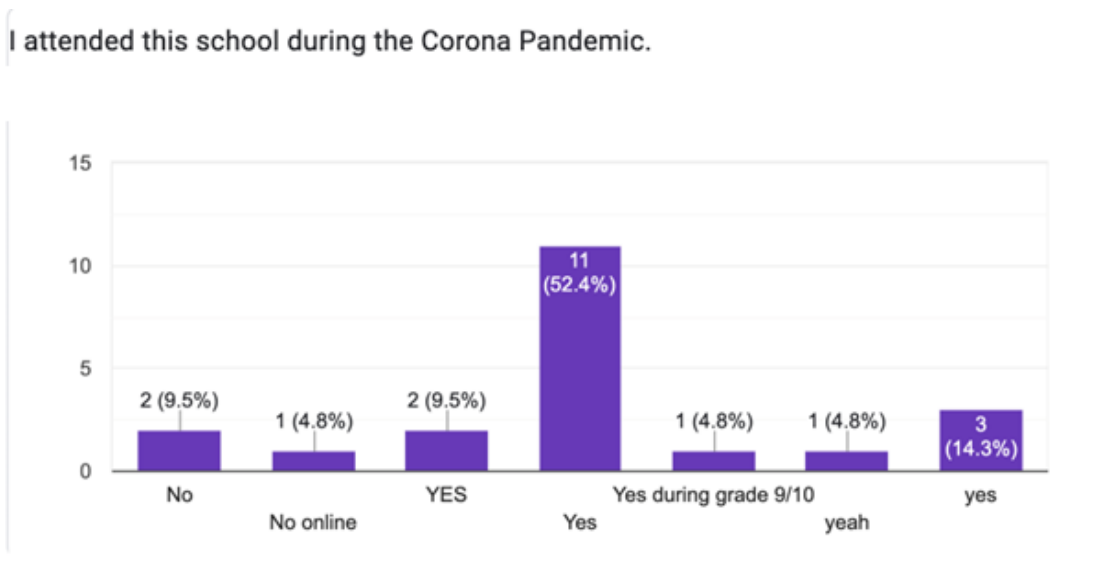


Figure 5: I attended this school during the Pandemic

When respondents were asked about attending school during Corona pandemic, eleven people said that yes, they attended school during the Covid-19 pandemic. Whereas 9.5% said that they did not attend school during the pandemic.

Section 2: The Impact of distant learning on student’s understanding of topics

From the above graph, it can be determined that 28.6% of respondents strongly agreed and somewhat disagreed with the fact that distance online learning has impacted students’ ability to ask questions. 23.8% said that they somewhat agreed with the fact that distance online learning has impacted students’ ability to ask questions. 9.5% of respondents said that they strongly disagreed with the fact that distance online learning has impacted students’ ability to ask questions.

How strongly do you agree or disagree with the statement: 'Distance online learning has impacted students' ability to ask questions?'

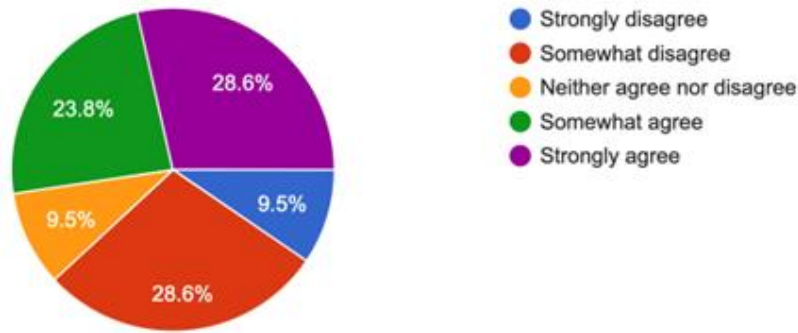


Figure 6: Distance online learning has impacted students ability to ask questions?

How strongly do you agree or disagree with the statement: 'Distance online learning has impacted students' ability to receive individualized support'?

 Copy

21 responses

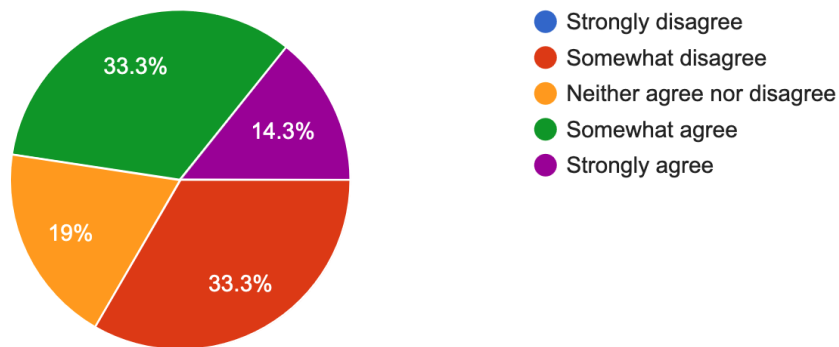


Figure 7: Distance online learning has impacted students ability to receive individualized support?

When the respondents were asked about distance online learning has impacted student's ability to receive individualized support, from the above graph, it can be seen that 33.3% of respondents said that they somewhat agree and somewhat disagree with the fact that distance online learning has impacted student's ability to receive individualized support. However, 19% of respondents said that they neither agree nor disagree with the fact that distance online learning has impacted students' ability to receive individualized support. And 14.3% of respondents strongly agreed to the fact that distance online learning has impacted students' ability to receive individualized support.

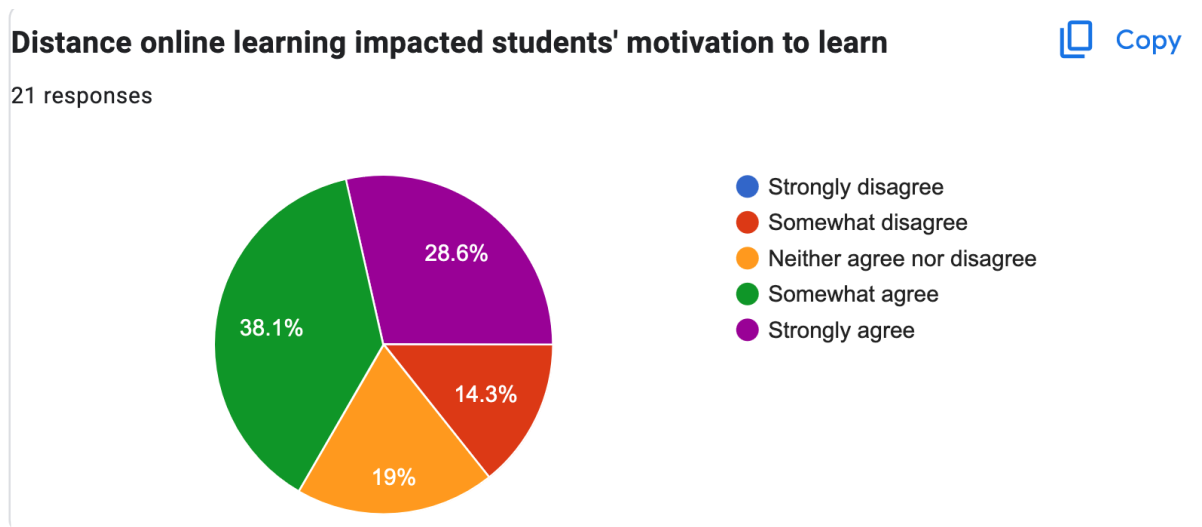


Figure 8: Distance online learning impacted motivation to learn

When the respondents were asked about whether distance learning has impacted students' motivation to learn, it was observed that 38.1% of respondents said that they somewhat agreed with the fact that distance learning has impacted students' motivation to learn. 28.6% of respondents were of strongly agreed opinion that distance learning has impacted students' motivation to learn. 19% said that they neither agree nor disagree with the

fact that distance learning has impact student’s motivation to learn. 14.3% said they somewhat disagree with the fact that distance learning has impacted students’ motivation to learn.

Distance online learning impacted positively students' ability to collaborate with their peers



21 responses

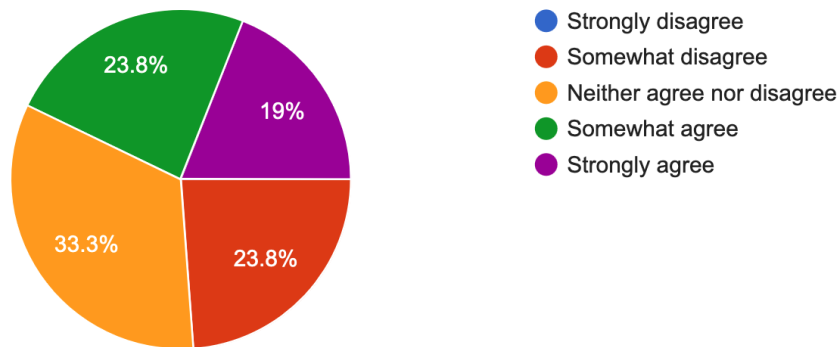


Figure 9: Distance online learning impacted positively students ability to collaborate with peers

When the respondents were asked about distance online learning impacted positively student’s ability to collaborate with their peers, 33.3% of respondents said that they neither agree nor disagree with the fact that distance online learning impacted positively student’s ability to collaborate with their peers. 23.8% of respondents said that they somewhat disagreed with the fact that distance online learning impacted positively student’s ability to collaborate with their peers. 23.8% of respondents somewhat agreed with the fact that distance online learning impacted positively student’s ability to collaborate with their peers. 19% of respondents strongly agreed to the fact that distance online learning impacted positively student’s ability to collaborate with their peers.

Distance online learning has impacted students' retention of course material positively



21 responses

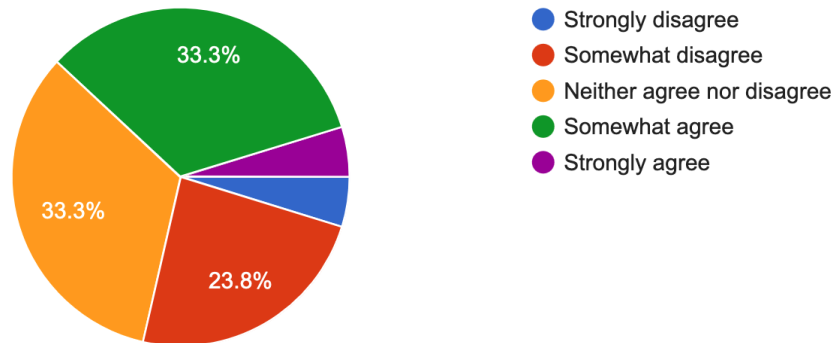


Figure 10: Distance online learning has impacted students' retention of course material positively

When the respondents were asked about distance online learning has impacted students' retention of course material positively, 33.3% of respondents said that they neither agree nor disagree with the fact that distance online learning has impacted students' retention of course material positively. 23.8% of respondents said that they somewhat disagreed with the fact that distance online learning has impacted students' retention of course material positively. 33.3% of respondents somewhat agreed with the fact that distance online learning has impacted students' retention of course material positively. 19% of respondents strongly agreed to the fact that distance online learning impacted positively student's ability to collaborate with their peers.

How strongly do you agree or disagree with the statement: 'The transition to distance learning has affected the overall achievement of students'?"



Please choose one of the following options:

21 responses

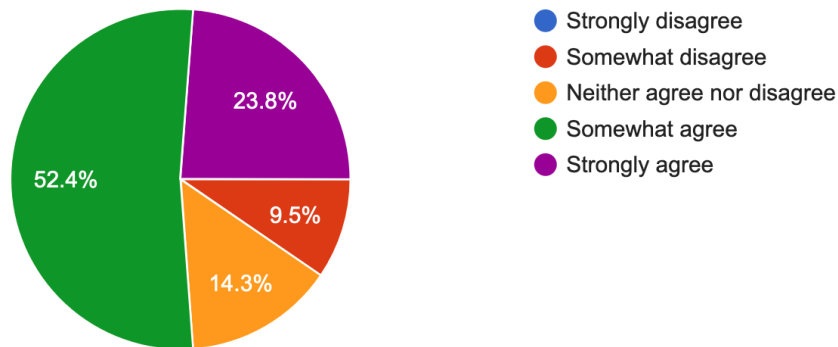


Figure 11: The transition learning has affected the overall achievement of students.

When the respondents were asked about the transition to distance learning has affected the overall achievement of students, 14.3% of respondents said that they neither agree nor disagree with the fact that the transition to distance learning has affected the overall achievement of students. 9.5% of respondents said that they somewhat disagreed with the fact that the transition to distance learning has affected the overall achievement of students. 52.4% of respondents somewhat agreed with the fact that the transition to distance learning has affected the overall achievement of students. 23.8% of respondents strongly agreed on the fact that the transition to distance learning has affected the overall achievement of students.

The transition to distance learning has had a negative impact on the overall achievement of students'?

 Copy

21 responses

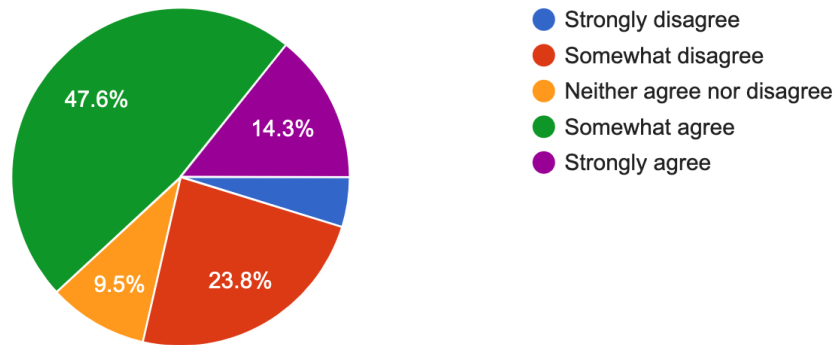


Figure 12: The transition to distance learning has had a negative impact on the overall achievement of students.

When the respondents were asked about whether the transition to distance learning has harmed the overall achievement of students, 9.5% of respondents said that they neither agree nor disagree with the fact that the transition to distance learning has had a negative impact on the overall achievement of students. 23.8% of respondents said that they somewhat disagreed with the fact that the transition to distance learning has had a negative impact on the overall achievement of students. 47.6% of respondents somewhat agreed to the fact that the transition to distance learning has had a negative impact on the overall achievement of students. 14.3% of respondents strongly agreed to the fact that the transition to distance learning has had a negative impact on the overall achievement of students.

How strongly do you agree or disagree with the statement: 'The transition to distance learning has had a positive impact on the overall achievement of students?'



21 responses

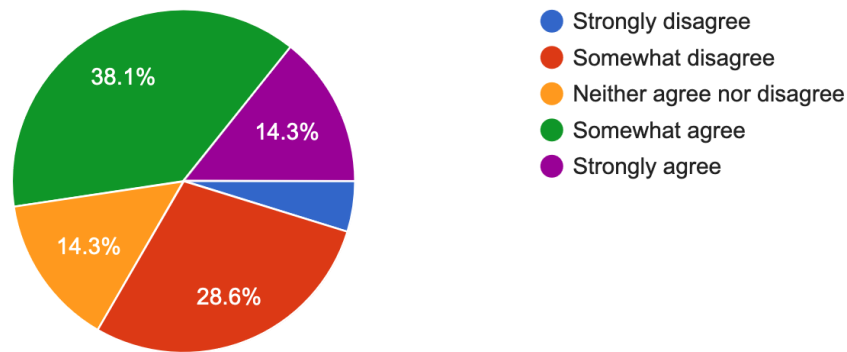


Figure 13: The transition to distance learning has had a positive impact on the overall achievement of students.

When the respondents were asked about whether the transition to distance learning has had a positive impact on the overall achievement of students, 14.3% of respondents said that they neither agree nor disagree with the fact that the transition to distance learning has had a positive impact on the overall achievement of students. 28.6% of respondents said that they somewhat disagreed with the fact that the transition to distance learning has had a positive impact on the overall achievement of students. 38.1% of respondents somewhat agreed to the fact that the transition to distance learning has had a positive impact on the overall achievement of students. 14.3% of respondents strongly agreed to the fact that the transition to distance learning has had a positive impact on the overall achievement of students.

How strongly do you agree or disagree with the statement: 'Distance learning presents challenges that may negatively impact students' achievement'?

21 responses

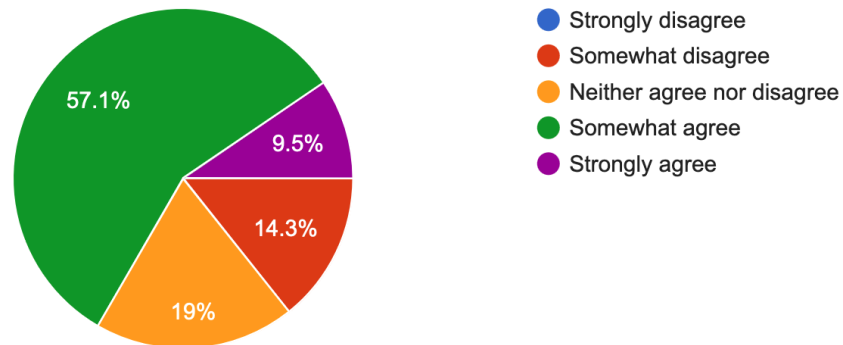


Figure 14: Distance learning presents challenges that may negatively impact students' achievement.

When the respondents were asked about distance learning presents challenges that may negatively impact students' achievement, 19% of respondents said that they neither agree nor disagree with the fact that distance learning presents challenges that may negatively impact students' achievement. 14.3% of respondents said that they somewhat disagreed with the fact that distance learning presents challenges that may negatively impact students' achievement. 57.1% of respondents somewhat agreed with the fact that distance learning presents challenges that may negatively impact students' achievement. 9.5% of respondents strongly agreed to the fact that distance learning presents challenges that may negatively impact student's achievement distance learning has had a positive impact on the overall achievement of students.

How strongly do you agree or disagree with the statement: 'Distance learning presents challenges that may negatively impact students' achievement'?

21 responses

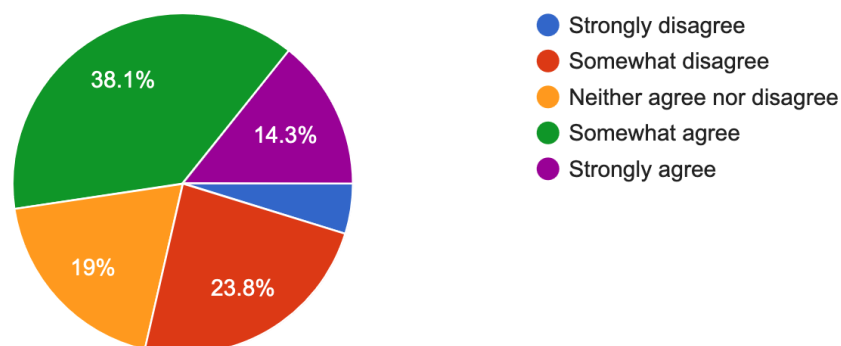


Figure 15: Distance learning presents challenges that may negatively impact students' achievement.

When the respondents were asked about distance learning presents challenges that may negatively impact students' achievement, 19% of respondents said that they neither agree nor disagree with the fact that distance learning presents challenges that may negatively impact students' achievement. 23.8% of respondents said that they somewhat disagreed with the fact that distance learning presents challenges that may negatively impact students' achievement. 38.1% of respondents somewhat agreed with the fact that distance learning presents challenges that may negatively impact students' achievement. 14.3% of respondents strongly agreed to the fact that distance learning presents challenges that may negatively impact students' achievement. Distance learning has had a positive impact on the overall achievement of students.

Effective strategies can be implemented to mitigate the negative impact of distance learning on student achievement'?

21 responses

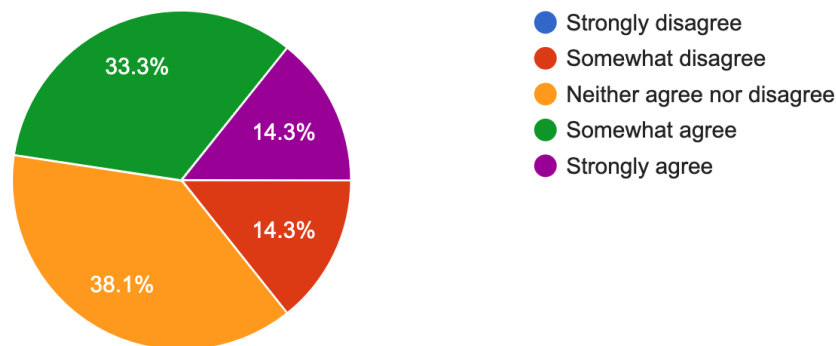


Figure 16: Effective strategies can be implemented to mitigate the negative impact of distance learning on student achievement.

When the respondents were asked about the effective strategies that can be implemented to mitigate the negative impact of distance learning on student's achievement, 38.1% of respondents said that they neither agree nor disagree with the fact that effective strategies can be implemented to mitigate the negative impact of distance learning on student's achievement. 14.3% of respondents said that they somewhat disagreed with the fact that effective strategies can be implemented to mitigate the negative impact of distance learning on students' achievement. 33.3% of respondents somewhat agreed with the fact that effective strategies can be implemented to mitigate the negative impact of distance learning on student achievement. 14.3% of respondents strongly agreed with the fact that effective strategies can be implemented to mitigate the negative impact of distance learning on student achievement.

There is a difference in achievement between students who have regular access to support and those who do not in distance learning'?



21 responses

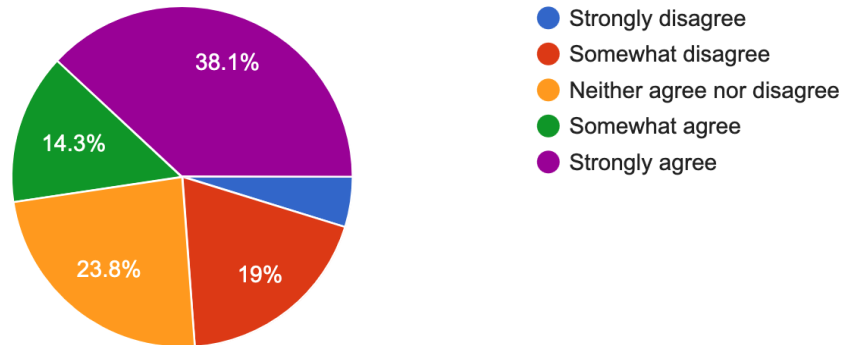


Figure 17: Difference in achievement between students who have regular access to support.

When the respondents were asked about the difference in achievement between students who have regular access to support and those who do not in distance learning, 23.8% of respondents said that they neither agree nor disagree with the fact that the difference in achievement between students who have regular access to support and those who do not in distance learning. 19% of respondents said that they somewhat disagreed with the fact that difference in achievement between students who have regular access to support and those who do not in distance learning. 14.3% of respondents somewhat agreed to the fact that the difference in achievement between students who have regular access to support and those who do not in distance learning. 38.1% of respondents strongly agreed with the fact that there is a difference in achievement between students who have regular access to support and those who do not in distance learning.

Distance learning has negatively impacted students' ability to collaborate and learn from one another



21 responses

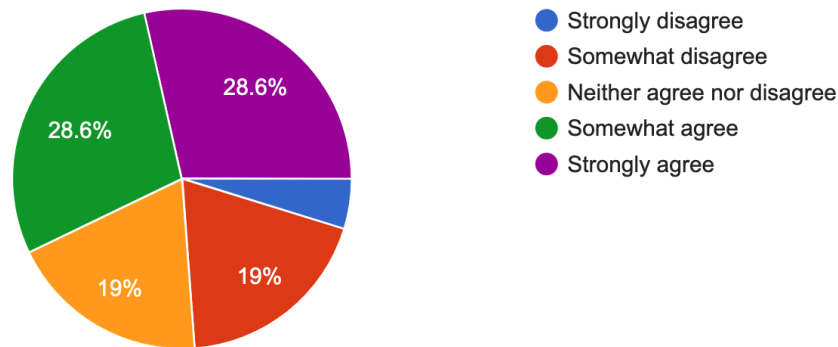


Figure 18: Distance learning has negative impact.

When the respondents were asked about how distance learning has negatively impacted students' ability to collaborate and learn from one another, 19% of respondents said that they neither agree nor disagree with the fact that distance learning has negatively impacted students' ability to collaborate and learn from one another. 19% of respondents said that they somewhat disagreed with the fact that distance learning has negatively impacted students' ability to collaborate and learn from one another. 28.6% of respondents somewhat agreed with the fact that distance learning has negatively impacted students' ability to collaborate and learn from one another. 28.6% of respondents strongly agreed to the fact that distance learning has negatively impacted students' ability to collaborate and learn from one another.

'It is important to implement measures to assess student progress and provide feedback in a distance learning environment?'



21 responses

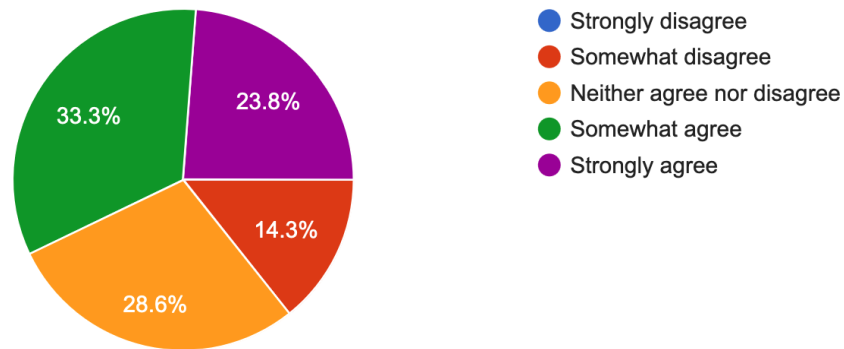


Figure 19: Implement measures to assess student progress.

When the respondents were asked about that if it is important to implement measures to assess student progress and provide feedback in a distance learning environment, 28.6% of respondents said that they neither agree nor disagree with the fact that it is important to implement measures to assess student progress and provide feedback in a distance learning environment. 14.3% of respondents said that they somewhat disagreed with the fact that it is important to implement measures to assess student progress and provide feedback in a distance learning environment. 33.3% of respondents somewhat agreed with the fact that it is important to implement measures to assess student progress and provide feedback in a distance learning environment. 23.8% of respondents strongly agreed on the fact that it is important to implement measures to assess student progress and provide feedback in a distance learning environment.

The implementation of distance learning has increased the workload and time commitment for students



21 responses

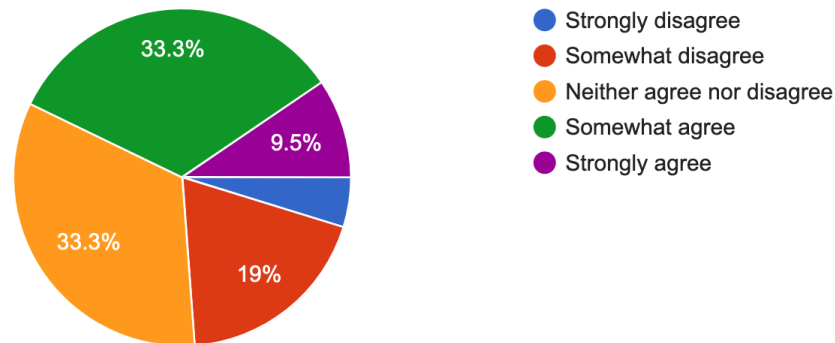


Figure 20: Implementation of distance learning has increased the workload.

When the respondents were asked about that if the implementation of distance learning has increased the workload and time commitment for students, 33.3% of respondents said that they neither agree nor disagree with the fact that the implementation of distance learning has increased the workload and time commitment for students. 19% of respondents said that they somewhat disagreed with the fact that the implementation of distance learning has increased the workload and time commitment for students. 33.3% of respondents somewhat agreed on the fact that the implementation of distance learning has increased the workload and time commitment for students. 9.5% of respondents strongly agreed on the fact that the implementation of distance learning has increased the workload and time commitment for students.

Distance online learning impacted positively students' focus and concentration

21 responses

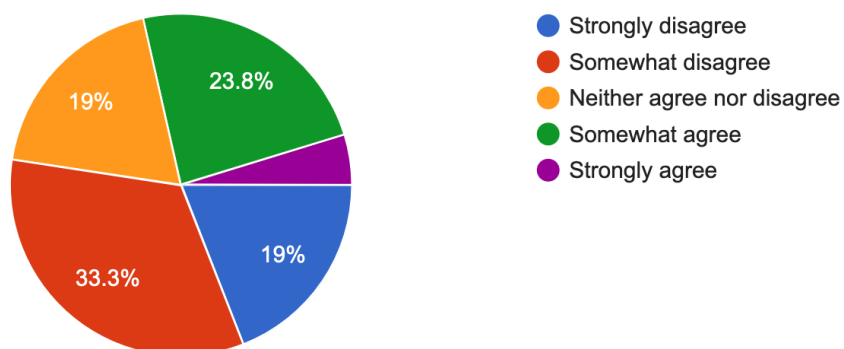


Figure 21: Distance online learning impact positively

When the respondents were asked about that if distance online learning impacted positively student's focus and concentration, 19% of respondents said that they neither agree nor disagree with the fact that distance online learning impacted positively student's focus and concentration. 33.3% of respondents said that they somewhat disagreed with the fact that distance online learning impacted positively student's focus and concentration. 23.8% of respondents somewhat agreed with the fact that distance online learning impacted positively on a student's focus and concentration. 0% of respondents strongly agreed on the fact that the implementation of distance learning has increased the workload and time commitment for students.

Teachers can play a role in helping students maintain focus and concentration during online learning'



21 responses

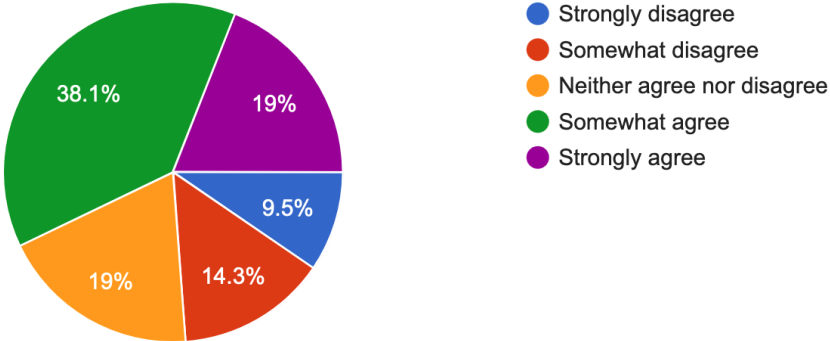


Figure 22: Teachers can play a role in helping students maintain focus.

When the respondents were asked about that if teachers can play a role in helping students maintain focus and concentration during online learning, 19% of respondents said that they neither agree nor disagree with the fact that teachers can play a role in helping students maintain focus and concentration during online learning. 14.3% of respondents said that they somewhat disagreed with the fact that teachers can play a role in helping students maintain focus and concentration during online learning. 38.1% of respondents somewhat agreed with the fact that teachers can play a role in helping students maintain focus and concentration during online learning. 19% of respondents strongly agreed on the fact that teachers can play a role in helping students maintain focus and concentration during online learning.

Online learning impact positively student engagement and participation



21 responses

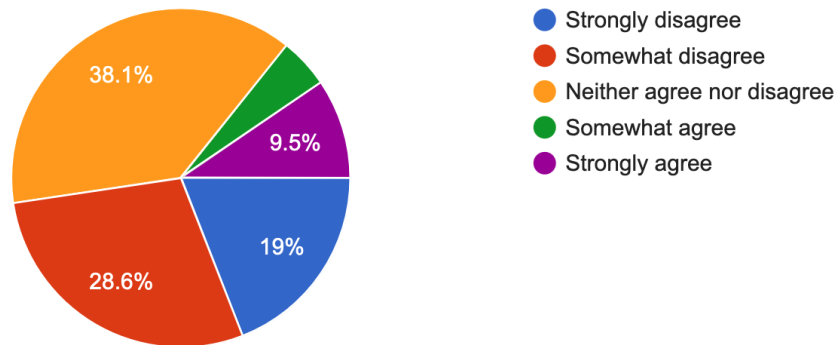
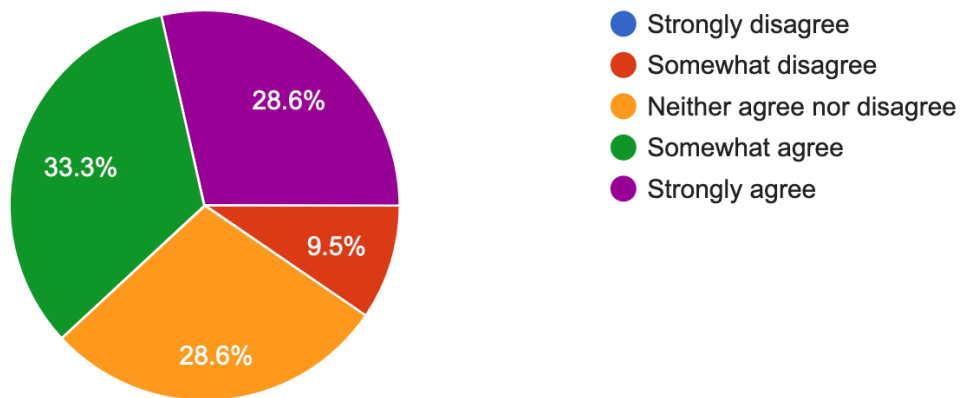


Figure 23: Online learning impact positively student engagement

When the respondents were asked about that if online learning impact positively student engagement and participation, 38.1% of respondents said that they neither agree nor disagree with the fact that online learning impact positively student engagement and participation. 28.6% of respondents said that they somewhat disagreed with the fact that online learning impact positively student engagement and participation. 0.8% of respondents somewhat agreed with the fact that online learning impact positively student engagement and participation. 9.5% of respondents strongly agreed with the fact that online learning positively impacts student engagement and participation.

Teachers can use encouraging and participation strategies through discussion forums and chat rooms to improve student engagement and participation during online learning

21 responses



When the respondents were asked about that if the teachers can use encouraging participation strategies through discussion forums and chat rooms to improve student engagement and participation during online learning, 28.6% of respondents said that they neither agree nor disagree with the fact that the teachers can use encouraging and participation strategies through discussion forums and chat rooms to improve student engagement and participation during online learning. 9.5% of respondents said that they somewhat disagreed with the fact that teachers can use encouraging participation strategies through discussion forums and chat rooms to improve student engagement and participation during online learning. 33.3% of respondents somewhat agreed with the fact that teachers can use encouraging participation strategies through discussion forums and chat rooms to improve student engagement and participation during online learning. 28.6% of respondents strongly agreed to the fact that teachers can use encouraging participation strategies through discussion

forums and chat rooms to improve student engagement and participation during online learning.

Chapter 5 Discussion

It is necessary to start with the importance of new technologies and virtuality in current education, the use of ICT strengthens communication and learning between teacher and student, so according to Aranda: "virtuality has to do with access and use of relevant information produced by all humanity; the use of specialized software and simulators and the concretion of knowledge in the network (knowledge communities)" (2013, p. 87).

Based on the considerations set forth; access to connectivity or internet with adequate bandwidth is essential at the time of class development; having technological resources (cellular computers) greatly contributes to this activity, since it provides the student with the necessary tools when completing the tasks. The identification of multiple or simultaneous jobs at home became distractors that influenced academic performance; Socioeconomic problems (work, family problems) are present in most of the families of the study subjects, to this is added spaces or environments that are inadequate for academic activities.

Each one of the listed factors influences the academic performance of the students, Murgueitio, insisted on the influence of these factors, as responsible for the academic performance, however, he made a differentiation in terms of the positive or negative attitude of the students. students at the moment of the teaching-learning process. At this point, it is necessary to develop an analysis of academic performance in subjects such as Accounting, Research Methodology, and Oral and Written Communication of students.

The results of the virtual education variable and its dimensions are presented, where it can be seen that 54.59% of the students think that virtual education has a good level, 35.80% that it has a regular level, and the 9.61% that have a bad level, that is, there is good

development of learning in virtual environments. Concerning the learning resources dimension, 56.77% of good level, 33.62% of regular level, and 9.61% of bad level were obtained, in other words, in the development of virtual education there are didactic and pedagogical resources. correct, they are also used appropriately. Regarding the virtual accompaniment dimension, it obtained 57.65% good level, 33.62% regular level, and 8.73% bad level, this means that students have the guidance and support of teachers. Finally, in the educational competencies dimension, the students believed that they perceive 55.90% of a good level, 34.06% of a regular level, and 10.04% of a bad level, which shows the good development of competencies by students during the development of virtual education.

The descriptive analysis of the virtual education variable and its dimensions gave the result that 54.59% of the students believe that virtual education has a good level, 56.77% believe that the learning resources dimension has a good level, 57.65 % perceive that the virtual accompaniment dimension has a good level, likewise, the educational competencies dimension has a good level of 55.90%. These results reflect that students have adapted to the teaching process through virtual environments since they have good resources and tools, have the guidance and support of teachers, and therefore have acquired the necessary skills.

These results coincide with what was exposed by (Cárdenas, et al., 2021), for whom in the construction of didactic resources, various elements should be considered, including pedagogical aspects, as well as the characteristics of the students, since in their work 4.35% of the students were undecided about whether the materials used were adequate, also 4.35% perceive that some learning resources benefit the acquisition of knowledge. Concerning the role of the teacher in virtual education, 97.82% of the students thought that the skills and knowledge of teachers are high, in addition to playing a guiding role. 35% perceive that some

learning resources benefit the acquisition of knowledge. Concerning the role of the teacher in virtual education, 97.82% of the students thought that the skills and knowledge of teachers are high, in addition to playing a guiding role.

About the descriptive analysis of the academic performance variable and its dimensions, the results indicate that 48.91% of the students perceive a good level of academic performance, the motivation dimension achieved a regular level of 47.16%, the capabilities dimension obtained 54.59% good level and the evaluation dimension reached 48.91% good level. The findings allow us to conclude that the students had a good academic performance during the development of virtual education, despite being little motivated, they also managed to strengthen their abilities and adapted favorably to the evaluation models used. This evidence coincides with the study by Valdivieso, Burbano & Burbano, 71.8% of the students interviewed thought that the virtuality of education favored the acquisition of new skills, however, it is contradicted since 36.5% considered that the development of virtual education from home affected their performance academic. That is to say, the academic performance was altered by the confinement and family coexistence, being that it decreased as a consequence of the little time that the students had to develop their academic activities.

From the inferential scope, it was determined that for the general objective of the study, there is a high positive correlation between the variables virtual education and academic performance, given that $\text{sig}=0.000<0.05$ and $r=0.725$. In this way, it is confirmed that the application of virtual education as a learning model during the covid-19 pandemic had a high impact on the academic performance of students in the industrial engineering career at Applied Technology University. These results are similar to the study by Quiñones, Martín & Coloma, 2021), who states that the development of teaching through virtual environments influences

the academic performance of students and that three aspects characterize it: teaching style learning, cooperative work, and digital skills. In addition, The dimensions that have the greatest weight to improve academic performance are knowledge of ICT, use of technological platforms, learning styles, and group work. In this sense, the students thought that in the development of digital competencies, they had a high level, since they are necessary for the development of academic activities, and that they are executed autonomously and through collaborative work.

Regarding specific objective 1, the existence of a high positive correlation between the learning resources dimension and the academic performance variable was verified, with $\text{sig}=0.000<0.05$ and $r=0.712$. Therefore, it is evident that the use of didactic and pleasant learning resources influences the academic performance of students in the industrial engineering career at Applied Technology University. These results are similar to the study by (Mora, et al., 2020), since in their results more than half of the students believed that the didactic processes and resources used achieved the understanding of the educational material, while a percentage much less thought that such resources did not provide help in the acquisition of knowledge.

About specific objective 2, the results showed that there is a high positive correlation between the virtual accompaniment dimension and the academic performance variable, since $\text{sig}=0.000<0.05$ and $r=0.739$. These findings allow us to conclude that having the support of teachers, as counselors and facilitators, affects the academic performance of students in the major.

Finally, for specific objective 3, the existence of a high positive correlation between the educational competencies dimension and the academic performance variable was

confirmed, considering that $\text{sig}=0.000<0.05$ and $r=0.691$. This reflects that the acquisition and development of educational skills through virtual education influences the academic performance of students in the Applied technology school, amid the covid-19 pandemic. Likewise, Mora, Mahecha & Conejo (2020) conclude in their study that students highlight the importance of the ICT-mediated pedagogical training process, and that academic performance is directly related to the approval of programs, and acquisition of competencies and abilities from the quantitative point of view.

The exponential growth of technology has promoted its application in all areas of society, from politics to education, the impact of communication networks and technological tools has enabled the creation and establishment of new realities. Regarding the educational issue, every day there are more practical applications that teachers give to technological resources to improve the efficiency of pedagogical actions and/or enhance the accessibility of students.

Considering the facilities provided by technology, a virtual classroom of the "Coexistence" curricular block of the Social Studies subject was developed for eighth-year EGB students. This resource is presented below, whose main objective is to improve the teaching-learning process of the students.

The proposed virtual classroom represents an opportunity for teachers of the subject of Social Studies in the teaching process. More than an instrument of pedagogical support, pretend to be a learning environment where students seek information, are instructed, practice and reinforce their knowledge and skills. For his part, the teacher will be able to present relevant information, transmit knowledge and establish productive contact with students in a group (in videoconferences) and personally (in spaces such as chat and video calls).

Thanks to its creation, teachers and students will experience a personalized, continuous education, consistent with their requirements and that responds to their learning pace. In today's technological age, where product updates are constant and obsolescence is frequent, an educational resource is needed that has a fast pace of modernization. Because of this, the proposal of this virtual classroom is justified by the versatility of its iteration.

The creation of the virtual classroom was viable thanks to the Microsoft Teams platform, with the multiple applications it offers and the office programs for creating and editing text, presentations, and spreadsheets.

Fundamentals

Pedagogy, as the social science directed at the study and application of educational theories of teaching and learning, is the basis for any formal instructional activity. In such a virtual, the present proposal was developed based on constructivist pedagogy.

Education through virtual media requires activities that arouse the interest of students and their autonomy, which is why inquiry-based learning postulates were incorporated. Finally, having the challenge of placing the student in front of a medium analogous to face-to-face education, where social reality is fully reflected, telepresence and the theory of media richness were used.

Constructivism

The Pedagogical theory considers the student as a proactive cognitive subject in the construction of his knowledge according to the stage of development in which he is. According to the Piagetian constructivist theory, the students of the eighth year of EGB are in the stage of formal operations, where the adolescent learns abstract systems, as a consequence, they will be able to use propositional and scientific logic.

The active and intentional role of the student is the basis for the creative construction of knowledge that, far from being static, is in constant change, evolution, growth, and restructuring. The knowledge that the student acquires makes sense and is reinforced by experiences, in such a way that the activities and knowledge that the teacher transmits and proposes must be aimed at its application in the real and daily life of the student (Rivera, 2008).

Through the constructivist educational process, the internal and external energies of the student are converted into means for their existence and development, readjusting and perfecting themselves at a psychological and biological level. Personal experiences, conditions, practices, and beliefs are expressed in society and its dynamic experiences, at the same time that these are reconfigured (Rosas and Sebastián, 2008).

The richness of constructivist theory allows the use of postulates from its different exponents. Ausubel's ideas were used, for example, so that the student relates the new information with the concepts that he possesses, thus enhancing their meaning. It can be produced in two dimensions: by reception and by discovery. Reception refers to the reception of knowledge in its processed form; while discovery occurs when the student investigates and finds important information for learning it.

The role of the protagonist the student allows his learning to be active and participatory, it is he who builds his learning while the teacher is only a mediator of the tools. The challenge that the teacher faces is to plan experiences so that they promote the student's skills and integrate learning into her thought structure, giving her interpretation according to what she has experienced and acquiring meaning.

In this pedagogy, there are two processes: assimilation, which occurs when the student internalizes the information; and accommodation, which is the process where previous schemes are modified based on what we have just learned. At this point, the teacher participates in the scaffolding, by facilitating the resources and directing the mental processes until the student internalizes the action and executes it on their own. This function is not only the responsibility of the teacher but also society (family, friends, colleagues, and other fellow citizens) can and should assume it.

Inquiry-based learning

Inductive methodology relevant for its transversality in contemporary educational processes made effective thanks to the discussion, communication, and reflection that it awakens in students. Various authors indicate that inquiry-based learning has a broad influence on metacognition and self-regulation of learning. The optimal model of inquiry includes conceptual aspects, procedural, epistemic, and personal that influence the affective and motivational spheres that are deployed in learning. Through inquiry, positive attitudes towards science and the appropriation of scientific ideas and processes by students are facilitated.

Telepresence and media richness

Media wealth theory focuses on what people do with media. In it, the advantage of social constructivism is used to justify face-to-face interaction through a video call; factors are carried out for the commitment of the participants; communication unfolds from the use of natural language through multisensory signals, accompanied by video conferences to instant feedback.

Telepresence is defined as the evocation of spatial and social illusion through advanced technology, integrating the community, cognitive and instructional components. It is a way of

communication and unilateral instruction where the teacher transmits the information to the student. The application of constructivism in this context stimulates the cognitive commitment that students have with the teacher and the subject in question, showing consequences in cognitive and affective performance. By applying social constructivism there is extensive interaction on topics of interest. In addition, students are helped to solve problems, conduct research, develop concepts, and think critically.

Each new technological medium introduced in teaching causes a change in the way teachers and students interact with information. Through movies, students can see important events portrayed by actors on the screens. Before they had to read about the industrial revolution, and now those images can come to life. With the inclusion of the actor's voice, it can be heard rather than read in a script. By incorporating narratives, students are linked to the film. Emails and text messages involve using cognitive and psychological components.

Of all the areas, those that showed the most influence on school performance, expressed by the student's annual grade, were basic skills ($r = 0.812$) and commitment and autonomy ($r = 0.884$). While the area that showed a low correlation was perception (0.273). The better the basic skills and the student's commitments and autonomy, the better their academic performance.

Technical skills are also significantly correlated with academic performance. The study carried out by Gómez (2021) serves as a reference to reaffirm this finding, in which it was identified that 30% of the students who showed low academic performance also misused the virtual classroom.

Despite not being prominent, communication showed a positive correlation with academic performance. Similar conclusions were reached by Berry (2019) who identified that

fluid communication between education actors (teacher-student) makes the use of virtual classrooms effective and deserves further investigation. Following the lines of this author, the more multimodal communication (video conferences and chat) the more efficient is virtual education. Likewise, Parker and Martin (2010) identified that online students highly value the ease of interaction with teachers in a virtual classroom.

It was observed that 100% of the students have access to a computer and Internet service either frequently or always. These tools are essential to benefit from virtual education, as explained in previous sections, 15% of the total population was excluded from the sample for having low attendance rates, which would be, in principle, caused by the lack of a computing device with internet service. This is how those students who, due to their economic condition, cannot obtain these types of tools, have been left behind in the educational system, a prominent problem in Ecuador, where according to the United Nations Children's Fund (UNICEF) (2021) 90,000 students have been left out of the educational system.

As technological tools become more complex, the percentage of availability decreases, in such a way that only 17% always have access to a device with a microphone and a web camera, which facilitate communication with teachers while classes are taking place. Gavotto and Castellanos (2021) found that teachers experienced negative emotions due to the lack of technological devices such as web cameras and microphones by students, going as far as discriminating against them, labeling them, threatening them and even affecting their grades due to such a lack.

Technological skills, Internet browsing, the use of email, and multimedia playback, represented a strength of the students, 82% indicated that they manage and can carry out these activities frequently. 94% stated that they can communicate through mobile devices, a skill

that is possibly related to the frequency of use of these tools by adolescent students, which has been increasing in recent years due to their easy access and popularity. A study carried out by Andrade and Anzules (2021) found that the most common technological equipment among the students' families is the cell phone (54%) compared to the computer (33%). Arias (2018) estimated that the average weekly use of cell phones among adolescents is 1,396 minutes. However, when asked about a skill that requires more preparation and knowledge such as the use of text editing programs, 41% indicated that they can rarely handle them.

The basic skills, summarized in reading comprehension and written communication, expressed dissociated results. While reading comprehension was experienced as sufficient to function in virtual education; Written communication represented a weakness in the students, since a large 58% stated that they can rarely write tasks and communicate in writing easily.

Anilema et al. (2020) concluded that only 13% of the students of an Ecuadorian rural educational institution reached a level of reading comprehension necessary for their educational status, the divergence of these results with those of the present investigation may be due to the instruments used.

Regarding the ability to communicate correctly in format, Caiza (2013) found that 42% of eighth and ninth-grade students are rarely careful to structure sentences with syntactic adequacy, 40.8% think that spelling is not important in writing and more than 57% do not try to use subject and predicate modifiers and complements in their writing.

The commitment and autonomy of the students expose that 58% of the students rarely accessed hyperlinks, suggested web pages, and complementary material, which constitutes a critical novelty. One of the strengths of virtual education is the wide availability of training material; not taking advantage of it means a considerable reduction in its efficiency. 64%

stressed that they frequently use Internet search engines to resolve doubts originating in the teaching process; however, it is striking that 29% of the sample stated that they rarely do it. Zambrano et al. (2010) observed that 98% of the students in virtual environments think that there is insufficient theoretical information for teaching about the correct access to learning resources on the Internet, faced with this, they propose to promote student autonomy by working on techno-operative skills to use web 2.0, search engines, platforms and servers for educational purposes. Thus, they also observed that only 19.67% of students access available complementary resources and that most of the income to the virtual platform is due to the review of notifications, information, and sending of evaluable tasks.

Training in the use of the virtual classroom is an important weakness of the students, 70% expressed that they are not trained in this matter. According to the results achieved by Fallon (2011), the less knowledge a student has about the use of a virtual education environment, the worse their educational experience is and can trigger frustration. 76% of the students frequently dedicated more than four hours a week to reading, reinforcing, studying, and doing homework, an aspect that is essential for effective learning in virtual environments. Thus, it was also identified that a large 81% never or rarely made a schedule to plan their asynchronous activities (basic tasks of this educational variety).

Chapter 6 Conclusions and Recommendations

It was established that there is a high positive relationship between the virtual education variables and the academic performance of students in the industrial engineering career of an Applied Technology University, in times of the covid-19 pandemic, given that $\text{sig}=0.000<0.05$ and $r=0.725$. This evidence indicates that the learning resources and tools and the support provided by teachers allow the strengthening of educational skills and abilities, which influences the academic performance of students.

The existence of a high positive relationship between the learning resources and the academic performance of the students of the industrial engineering career of an Applied Technology school was verified, in times of the covid-19 pandemic, being that $\text{sig}=0.000<0.05$ and $r=0.712$. That is to say, the resources, didactic tools, ICT, and methodology directly influence the academic performance of students. Therefore, in order to determine the incidence of virtual education on academic performance during the Covid-19 pandemic in first-year high school students, it is concluded that the majority of students affirm that virtual education does influence academic performance. since some teachers are not usually clear at the time of teaching their classes and the students do not feel fully satisfied when receiving the classes.

It is concluded that after the application of the Sp-Deles questionnaire, the degree of satisfaction presented by first-year high school students is in a satisfactory range based on the scales raised in the questionnaire about virtual classes. Despite the fact that the change from face-to-face to virtual was sudden, students have been positively adapting to this new learning style, through the help of teachers through innovative strategies that contribute to their teaching-learning process.

It is concluded that the academic performance according to the categories established in the survey is mostly at an appropriate level, but students prefer face-to-face education over virtual education, however, in terms of their grades there is no low performance. Regarding what was previously discussed, it was possible to establish the relationship between virtual learning variables and academic performance through the adaptive analysis of students to the new distance modality through the use of ICTs. Students and teachers had to get to know day by day the operation of the various educational tools which were essential when carrying out their homework and teaching classes. Despite the difficulties in connectivity and various problems that arose, both students and teachers were able to continue with their educational work.

The high positive relationship between virtual accompaniment and the academic performance of the students of the industrial engineering career of an Applied Technology school was confirmed, in times of the covid-19 pandemic, since $\text{sig}=0.000<0.05$ and $r=0.739$. In other words, the role of the teacher and his capacity for understanding, orientation, and flexibility, during the performance of virtual teaching, significantly affects the academic performance of students.

It was determined that there is a high positive relationship between educational competencies and the academic performance of students in the industrial engineering career of an Applied Technology school, in times of the covid-19 pandemic, considering that $\text{sig}=0.000<0.05$ and $r=0.691$. In this sense, it was concluded that the acquisition of educational skills, the way of studying, and the virtual environment, benefited the development of academic skills, which influenced the academic performance of students.

Recommendations

It is recommended that the Educational Unit provide teachers with training, support, and advice on virtual platforms and the use of ICTs in the teaching-learning process, before starting any type of training experience with students based on virtual environments.

It is recommended to use recreational activities before starting classes, that is, introductory activities that improve the educational environment and that both teachers and students feel good when carrying out their academic activities.

It is recommended that teachers at the time of sending homework, inquiries, and research papers or when applying evaluations activities should be regulated so that there is a balance between having adequate academic performance in a quantitative way and significant learning that lasts in the student and improves thus the quality of teaching of the Educational Unit.

It is recommended to provide workshops to the teaching staff of the Educational Unit so that they can significantly reach the students to motivate and encourage them in the teaching-learning process through the use of ICTs, for greater adaptability in the virtual modality.

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