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**EFFECTIVE AUDIO AND VIDEO-BASED
LEARNING FOR THE YOUNGEST AGE**

Basmel Omer Akram AL-SIRAG

Master's Thesis

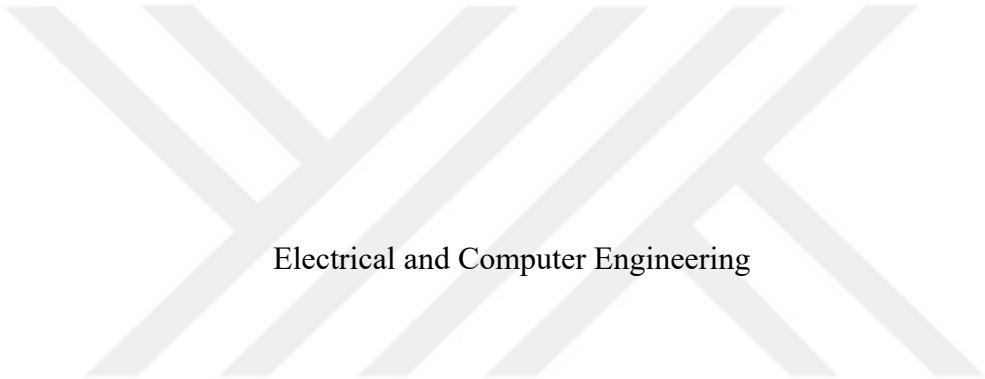
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The thesis/dissertation titled Effective Audio and Video-Based Learning for The Youngest Age (effective book for young age) prepared by Basmel Omer Akram (CANDIDATE’S FIRST AND LAST NAME) and submitted on (DATE) has been **accepted unanimously/by majority of votes** for the degree of Master of Science in electronic computer engineering (ECE)

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Basmel Omer Akram AL-SIRAG

Signature

XXXXXXXXXX

DEDICATION

Except with his permission.

My thanks, gratitude, and success from God are:

The permission knows what is between their hands.

With my thanks and appreciation to everyone who loved science and sought to develop it.



ABSTRACT

EFFECTIVE AUDIO AND VIDEO-BASED LEARNING FOR THE YOUNGEST AGE/DISSERTATION

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Various types of e-learning have been discussed. And the effective of images, sound, and video on learners, under the age of six, Furthermore, the focus is on developing a child's intelligence in all its forms, achieved through the presentation of specific intelligence questions tailored to the age group in question.

Keywords: E-Learning, Effective Book, youngest age, IQ Exam, IQ Test, Emotional intelligence, Learning Management System.

ÖZET
EN KÜÇÜK YAŞ İÇİN ETKİLİ SES VE VİDEO TABANLI
ÖĞRENME/TEZ

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Çeşitli e-öğrenme türleri tartışılmıştır. Görüntülerin, seslerin ve videoların altı yaş altı öğrenciler üzerindeki etkisi. Ayrıca, söz konusu yaş grubuna göre hazırlanmış özel zeka sorularının sunulması yoluyla çocuğun zekasının her türlü şekilde geliştirilmesine odaklanılmaktadır.

Anahtar Kelimeler: E-Öğrenim, Etkili Kitap, En Küçük Yaş, IQ Sınavı, IQ Testi, Duygusal Zeka, Öğrenme Yönetim Sistemi.

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ABBREVIATIONS

MI	:	Multiple Intelligent
LMS	:	Learning Management System
IQT	:	Intelligence Quotient Test
EQ	:	Emotional Intelligence
VR	:	Virtual Reality
ADC	:	Analog to Digital Converter
DAC	:	Digital to Analog Converter
HD	:	High Definition
GUI	:	Graphical User Interface

1. INTRODUCTION

1.1 SUMMARY

Various types of e-learning have been discussed. And the effective of images, sound, and video on learners, under the age of six, Furthermore, the focus is on developing a child's intelligence in all its forms, achieved through the presentation of specific intelligence questions tailored to the age group in question.

Through this research, various types of e-learning have been discussed and analysed to determine their effectiveness. In Additions, the effective of images, sound, and video on learners, particularly for preschool children under the age of six, has been explored. As children at this age are not yet able to read or write, visual and auditory aids have been relied upon to convey information, aiding in the development of their physical, motor, sensory, and interactive intelligence. This approach also reduces the need for lengthy lectures, as e-learning features can be utilized to minimize the use of paper and pens, thereby promoting environmental conservation. Furthermore, the focus is on developing a child's intelligence in all its forms, achieved through the presentation of specific intelligence questions tailored to the age group in question.

The idea of the research is an interactive electronic book, but in reality, it is an intelligence test. The questions asked during the test are questions that require focus and quick interaction. The test consists of a sequential set of questions that the student gets used to. After testing the questions, the result was that most of those who took the test were happy to take it and asked for more questions. This is This indicates that the human mind still loves learning despite the development of the era and the abundance of devices, and despite their abundance, we need to stimulate the mind from time to time.

The research initially consists of a group of similar works, after which an introduction was listed containing information about education and its types, an explanation of the importance and disadvantages of each type, and a focus on e-learning in a brief manner. The topic of the educational system, how its forms and degree of complexity are discussed, and after that was clarified, the topic was discussed. Intelligence of all kinds, when did intelligence tests appear, and the difference between intelligence and emotional intelligence, and then arriving at the

topic of playing for learning and the importance of electronic games, taking into account the harms of electronic games. The topic of role-playing was addressed, where students take on the role of the teacher to teach the students and explain its effect on the quality of learning, then Reaching the subject of systems architecture, their types, and the use of each of them. Because data needs protocols for transfer, the subject of data transfer protocols and the specifications of the system on which it depends was taken, leading to an explanation of the practical side of the research project and a statement of the program and library used in the practical side. This is what concerns the third part. As for the fourth part of the research, it initially dealt with design considerations for font, image, sound, animation, and video, leading to the results obtained with each age group, explaining the details of the test, how many questions, why the number and reason for choosing it, and arriving at an explanation of the most important libraries that were chosen in The practical part presented graphical charts about the research results, and each group was separated from the second to show the results correctly, when the results were largely satisfactory. In the last section, a number of future points were placed that we will work on to improve the test.

Education is a fundamental right for every child. It is important to note that a child's intelligence is not fully developed, but rather continues to grow and develop throughout the early stages of life. Therefore, this research aims to discover methods to enhance a child's intelligence through the use of visual aids such as images, videos, and audio. By utilizing these tools, we can create a more engaging and interactive learning experience for children, ultimately leading to a more successful educational journey.

In today's world, e-learning is the most prominent type of learning, but different age groups require different types of e-learning. These include synchronous and asynchronous e-learning, as well as blended learning that combines e-learning and traditional classroom learning. Each type has its own advantages and disadvantages, requiring specific components and learning resources. It is crucial to consider each child's individual needs and learning style to determine the most suitable type of e-learning. This ensures that every child has access to quality education and the opportunity to reach their full potential.

Education requires specialized learning resources and tools. Some of the necessary learning resources include electronic books, databases, websites, social media platforms for

communication, digital libraries, and more. On the other hand, learning tools depend on the type of electronic learning. If the learning is direct, then a display screen is necessary for information sharing between the student and teacher. However, if the learning is indirect and relies on a computer, then at least a communication device such as a phone and an internet connection are required, along with an audio medium.

It is evident that electronic learning has its challenges, as not all students have access to the necessary communication tools due to their high cost. Therefore, it is crucial to ensure that electronic learning is accessible to all students, regardless of their financial situation. By doing so, we can ensure that every student has an equal opportunity to learn and succeed [1].

Through this research, an interactive book will be built in which the level of intelligence of children under the age of six, i.e., the age of kindergarten, will be tested in an interactive entertaining way between the learner and the teacher, and the output of this output will be saved in a database.

1.2 RELATED WORK OF OUR WORKING:

Some of the research related to our research project will be discussed, including:

- i. The research [2] focuses on the challenges facing education and the recognition of the importance of individual and online learning. It explains the structure of electronic educational systems and their main components. The project was tested on a sample of secondary and preparatory school students. The architectural system consists of three main parts. The first part contains basic information, mostly static information that does not change, such as student information. The second part contains training courses and additional information. The final part contains adaptive learning components generated through the utilization of student information and their results from previous courses to generate more adaptive to the learner.
- ii. The research [3] discusses the challenges of education and the necessity of finding new learning methods, including interactive education. It emphasizes the importance of providing students with the opportunity to innovate and learn through self-learning or individual learning. The research also explores computer-based education and how to incorporate social media into learning, utilizing this feature to encourage students to

learn and develop their abilities. Furthermore, the research discusses the architecture of active and non-active educational systems (synchronous and asynchronous), where interaction between students is available to create a more beneficial learning environment by facilitating communication and utilizing stored knowledge in a database to generate questions that are suitable for the learner.

- iii. The research [4] discusses emotional intelligence and its importance for learners, as well as its impact on students' response and growth, especially in early stages of development. The study included a number of elementary school students from ten government schools. The results showed that students with emotional intelligence were less prone to bullying, as they were able to understand their needs and were less likely to be verbally or physically harmed. Additionally, these students had a higher educational level compared to those who had less ability to defend themselves, as they were less capable of acquiring information.
- iv. The concept of [5] prior knowledge and its importance in acquiring information more quickly was introduced. Several students from preparatory and university levels were tested, and a significant advantage was observed among those who possessed prior knowledge, especially in class of mathematics. Prior knowledge provided them with liberation from anxiety and fear, resulting in better performance compared to those who learned through traditional methods. One of the methods of prior knowledge is electronic games, and after involving students who learned in the traditional way with electronic games, a clear increase was found in their educational level, which confirms that games have a positive effect if these games are appropriate and guiding.
- v. This research [6] discusses the significance of prior knowledge through electronic games and the benefits these games provide in facilitating education. Despite the existence of numerous studies indicating that games reinforce negative and incorrect concepts, this research focuses on the importance of games in helping learners develop knowledge of the English language and skills such as communication and quick thinking, which overall impact their educational level.
- vi. Due to the potential increase in cases of hearing impairment, this research [7] presents a method for learning sign language by providing a program that operates through programming interfaces and presents illustrative content to the learner. Since these special cases deal with the sense of sight without the sense of hearing, the research aims

to find the best means to produce the closest output. This was achieved by introducing a set of data that is processed to generate some hidden hybrid layers, which in turn generate a more accurate outer layer. This process involves inputting text and processing it through the inner layers to generate suitable sign language output.



2. SECOND CHAPTER

It was necessary to understand the future prospects of the body before starting the project in order to increase its efficiency. The human eye captures light and sends information to the eye network, thus forming the image inside the human eye, which is then interpreted within the brain. The human eye differs in complexity from other organisms as it is composed of three main layers: an outer layer of fibrous tissue that is 65% opaque and 15% transparent, a middle layer that connects between them, and after that, the inner nerve layer. Similarly, touch sensation through the hand is considered another way to fix information and hearing as well [8].

This type of learning known as multiple intelligence learning (IM) includes various types: visual/spatial intelligence, verbal/linguistic intelligence, logical/Mathematical intelligence, musical/rhythmic intelligence, interpersonal intelligence [9].

In General, looking, the types of interactive learning style model can divide into: visual, auditory, auditory, kinaesthetic.

There is difference between the Learning intensity and quality of learning the intensity of learning and the quality of learning. It is possible to choose an effective learning method that consolidates the information more than the intensification of learning. It is difficult to learn or comprehend the information if the method is not appropriate. If we want a group of students to understand how to grow a plant, it is obvious that it is easier to grow the plant in front of the children's eyes and share the cultivation with them instead of explaining. The lengthy one is not useful to them, and this is what is known as interactive education. In this case, they used the sense of sight (visual learning), sound (auditory learning), and sensory education (kinaesthetic learning) [10].

With the different types of education, there is no clear preference for students for how to learn, due to a difference according to time, age, and the educational environment, but in general, research shows that one learner differs from the other, but there is consensus on the preference for learning using multimedia or coloured pictures instead of a one-color picture or writing [11].

It is widely known that learning a new foreign language requires effort. To make the process of learning a foreign language easier and more accessible for children, interactive learning through various communication applications can be utilized. This not only enhances their cognitive abilities but also increases their intelligence quotient [12].

Interactive books have proven to be beneficial in developing skills such as hand-eye coordination, reinforcing ethical and scientific concepts, and improving perception through listening to information and discovering new things such as foreign languages, colours, shapes, and behavioural patterns. Here, we arrive at the realization that there is a significant and clear difference between interactive electronic books and traditional electronic books [13]. The former stands apart from the latter due to its inclusion of dynamic information, which captures the attention of children and enhances their learning experience. On the other hand, the latter is geared towards an older age group, as it contains fewer colourful images and relies heavily on written content to convey educational concepts. It is important to note that interactive electronic books offer a more engaging and effective approach to learning, particularly for younger audiences [14], the interactive book has an impact on the children's brain and the development of their ideas, and this is what is required of interactive learning, whether electronic or non-electronic [15].

electronic education has been around for quite some time, but it has evolved tremendously during this current century, With the advancement of technology, it has become an urgent necessity that provides more benefits than drawbacks. With the availability of new interactive methods and the amazing feature of artificial intelligence, it provides a learning environment that is accessible to all learners online, without the need for synchronous communication with the teacher or the need to commit to a specific number of students. This is due to the high costs of schools and the large number of students. However, on the other hand, we need a communication device and a network that provides internet access to all parties [16].

Over the past five years, there has been an increasing need to find alternative methods of learning outside of the traditional classroom setting. This is largely due to factors such as the spread of the COVID-19 pandemic, which has suddenly shifted education towards online learning on a wide scale. The impact of this shift varies from one age group to another and from one subject to another. For example, there is a difference between teaching mathematics

and teaching science, which must be taken into account when designing educational projects [17]. Teachers have attempted to find flexible methods to overcome this situation, changing their presentation methods to engage learners. It is natural to resist such a rapid transformation, but over time, as people become accustomed to the new approach, there has been an increase in the efficiency of learning. This is because online learning is more flexible and provides various communication methods, making it more acceptable [18] [19].

When utilizing electronic learning, there are potential challenges that may arise, such as identity theft, incorrect data input, and unauthorized changes to information. To address these concerns, it is essential to implement secure login credentials and encryption protocols to safeguard the privacy of sensitive information. Teachers must also establish access controls to ensure that only authorized individuals can access the program and maintain the integrity of the database [20]. In any project, a reliable database (necessary to return and receive data) is crucial for data retrieval and management. Therefore, it is imperative to establish a robust database that can be relied upon for accurate and timely information. we can ensure that electronic learning remains a safe and effective tool for education [21].

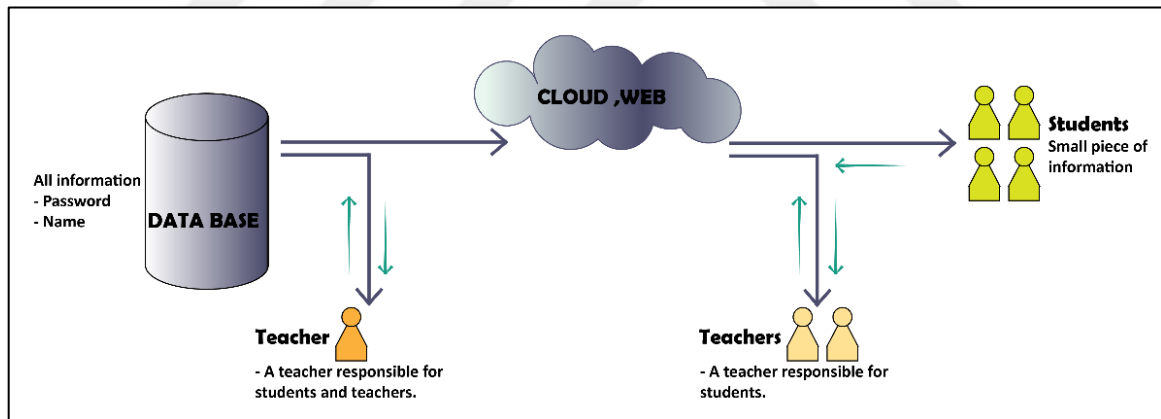


Figure 2.1: Secure Fog-Based E-Learning Scheme.

In order to determine a learner's preferences, it is recommended to review their performance on previous exams. Previous research has shown that students prefer visual aids such as symbols, diagrams, and flowcharts to help clarify information. Additionally, listening to audio and engaging in practical activities or experience sharing can enhance communication during the learning process. It is important to note that storing this information should be kept separate from student records and stored in a separate database for testing purposes. By

utilizing these methods, educators can better understand and cater to the individual learning styles of their students [22] .

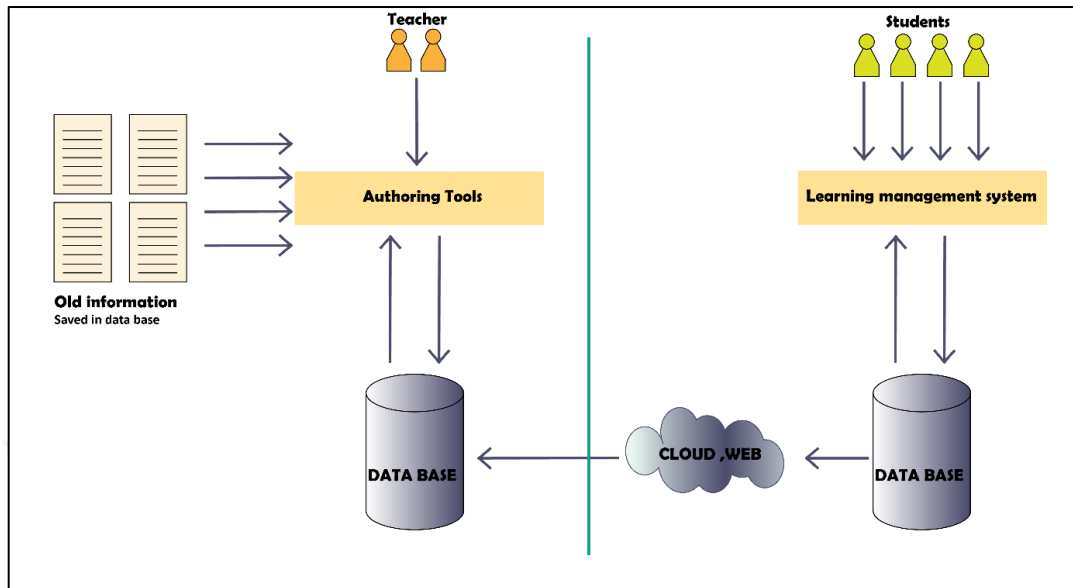


Figure 2.2: The E-Learning Style -Based Adaptive Learning.

That system known as learning management system (LMS) this is an integrated educational system that contains accessible information for learners and educators. The information is isolated and securely stored, allowing for easy retrieval when needed. Its importance has become increasingly evident in recent years, as it provides an electronic learning system for both school students and self-learners [23].

Upon conducting research, it has become evident that any educational system requires a database to collect information and a means of internet and device connectivity. This can be achieved through the use of three main components: learner models, content models, and inference models.

The first component, learner models, pertains to the learner's basic information and is typically in the form of a database. The second component, content models, contains general information such as tests and is static in nature. The third component, inference models, takes the data from the first two stages and produces a third output, which leads to new questions and provides more informative courses for the learner. It has been found that learners prefer the second or third type, provided that the system has a flexible format and an easy-to-use interface [24]. Furthermore, it is possible to add communication tools such as

clouds to facilitate synchronous or asynchronous communication between learners and teachers. Other essential components, such as a proposed basic educational system database monitored by teachers and basic information for students, can also be added. It is worth noting that the complexity and development of the system depend on the age group of the learners [25]. The early stages of education do not require a complex system as learners are still in the learning phase. However, older age groups require additional features such as clouds and chat applications to enhance individual learning [3].

It should be noted that when transitioning from traditional classroom education to e-learning, many students notice the difference between learning in a group versus being isolated in a room. but, with the availability of communication platforms and the ability to search for and solve problems online, students can adapt to this new form of education. This is commonly referred to as collaborative or collective learning. By utilizing these tools, students can still learn and interact with their peers, despite not physically being in the same room [26].

In order to distinguish between traditional and modern e-learning, we need to gather knowledge from students and generate new knowledge based on the input received. This will result in more accurate information that can be utilized in everyday life and in future workplaces. The success of the learner depends on their effort and ability to learn from mistakes and avoid repeating them. The best way to acquire knowledge is through experimentation, such as listening to a story or anecdote that requires critical thinking to arrive at a new understanding. By utilizing these methods, we can effectively retrieve and apply information from the human mind, leading to a more seamless and efficient learning experience [27].

After gaining an understanding of the educational system and its various types, it is now necessary to delve into the study of different types of intelligence questions and the factors that affect human intelligence during the early stages of development. Studies conducted by nutritionists have revealed that certain types of food can enhance children's intelligence, such as peanut butter, avocado, broccoli, whole milk, eggs, and fish [28].

3. THIRD CHAPTER

3.1 METHODOLOGY AND RESULT

The term "Intelligence Quotient Test" (IQT) originated from the German psychologist William Stern. The IQ test is a tool used to measure an individual's intelligence through a series of questions. It is important to note that the IQ test is not the only measure of intelligence, as there are various types of intelligence that cannot be measured through this test alone. Understanding the different types of intelligence and the factors that affect it is crucial in developing effective educational strategies. It is also important to recognize that intelligence is not solely determined by genetics, but can be influenced by various environmental factors, including nutrition. By taking a holistic approach to education and considering all aspects of intelligence, we can better equip individuals to reach their full potential [29]. The real age (chronological age) is linked to the mental age, and this is what is known as the term (intelligence quotient), that is, the percentage of intelligence depends on the amount of development that occurs in the human mind, and this term has been used for more than thirty years, and we need to add a prior prediction before the test to know mutations and measure the degree talent, especially in children [30].

It is essential to understand that a child's intelligence is inherited through genes, with 50% of their traits coming from their parents. The remaining 50% is acquired through life stages, especially during the early years before puberty. Therefore, parents must consider their children's intelligence centres, develop them, and observe any changes to identify their strengths and improve them [33].

With the current development of artificial intelligence and its widespread applications, it was necessary to enhance human intelligence and understand its aspects. Human intelligence is not limited to solving complex mathematical problems, but also includes visual, auditory, and retroactive intelligence (the ability to retrieve information from the brain quickly). It also includes motor and inferential intelligence, where a child can solve problems and make inferences better than other children [34].

Since children cannot write or read before the age of six, intelligence tests focus on shapes, drawings, images, simple mathematical operations, and shape arrangement. Python language was chosen because it is easy to program, smooth, and understandable for most

programmers. It is also easy to handle and avoid errors, add and modify, and can be linked to multiple programs or languages. It is easy to develop and work on in the future, and the programming code is straightforward due to the availability of many ready-made libraries that aid in programming. Virtual Studio was used to facilitate the use of the program by children, with its simple graphical interface library [26].

Due to the fact that the target audience for this project is children under the age of six, specifically those in kindergarten, it was necessary to incorporate images, sound, and animation. The images are colourful and composed of three bytes, each representing a specific colour. However, in order to properly distribute the elements, we require an area known as "interesting regions." Based on this, the text and images are distributed while taking into account the age group. Younger ages require larger and more frequent images than older ages [31]. As for sound, it is a sequence of waves that are converted into a digital signal for the computer to recognize. Video, on the other hand, is a sequence of images, each with its own quality. These media are linked using the Python (GUI) language to make it more accessible to children [32].

The University of Oxford is a prime example of the effectiveness of online education. Its online platform requires subscription and commitment to completing a number of tests to pass. Despite being located in a specific physical location, a large number of students from distant areas are enrolled in the program. The platform's advantage lies in its accessibility, as it only requires internet access to join. Additionally, it offers multiple evaluation stages for each level of education [35].

One of the advantages of e-learning is that it provides access to education for a larger number of students. This was observed in California, where the number of students in a targeted school increased from 2,800 in 2000/1999 to 5,900 in 2001/2000 with the implementation of e-learning. Additionally, most students in schools with e-learning systems achieved significant progress, especially those with low performance and low-income backgrounds. In 2001/2002, Florida provided grants for students who failed or struggled with e-learning, as well as those with special needs, which increased the effectiveness of e-learning [36].

To obtain useful results from e-learning, governments need to allocate resources and effort to monitor and support the implementation of e-learning. With the recent proliferation of e-

learning projects, it is essential to consider three important aspects of any project. The concept of e-learning is based on three important areas that complement each other: the technical aspect for computer technology, electronic devices, and software; the educational aspect for the teacher and educational information; and the psychological and social aspect to observe the impact of e-learning on students' social relationships, learning perception, and future work readiness. Therefore, it is crucial to consider all aspects, advantages, and disadvantages of any e-learning project before implementing or disseminating it [37].

Moreover, it is important to ensure that e-learning is accessible to all learners, regardless of their socio-economic background or physical abilities. This can be achieved by providing necessary infrastructure, such as internet connectivity and devices, to learners who may not have access to them. Additionally, e-learning platforms should be designed to accommodate learners with disabilities, such as visual or hearing impairments. By making e-learning accessible to all, governments can ensure that no learner is left behind and that everyone has an equal opportunity to benefit from this innovative approach to education.

The difference between the (IQ exams, IQ tests, and EQ tests):

The skills and intelligence tests include IQ exams, IQ tests, and EQ tests. The IQ exam is the most accurate intelligence test, consisting of 30 questions. On the other hand, IQ tests rely on both long-term and short-term memory, as well as puzzles with four options. There are various types of intelligence tests, such as the 30-question IQ exam or the 40-question emotional intelligence test [38]. The intelligence aspect comprises two parts: the intellectual side, measured by the IQ intelligence quotient (IQ Exam) with 30 questions developed by the McGill university, and the emotional side, measured by the emotional intelligence test (EQ tests).

And the Emotional Intelligence (EQ) is a crucial aspect of a child's development. While some research suggests that children are born with this intelligence, it does not mean that it does not require further development. Studies have shown that individuals with lower emotional intelligence are more susceptible to bullying in schools. Therefore, it is essential for children to study, experiment, and discover all emotions, control them, and distinguish between negative and positive thoughts. This is known as emotional awareness [39].

There are several factors that indicate strength in emotional intelligence, including self-awareness, self-regulation, empathy, and social skills. Self-awareness involves understanding oneself, while self-regulation involves understanding what is needed to regulate reactions and avoid stress. Empathy and social skills are also crucial components of emotional intelligence. Improving emotional intelligence does not necessarily require external motivation or rewards. However, it may be helpful to seek inspiration from time to time. When communicating with others, it is essential to show empathy and avoid rushing to judgment. Finally, having a social circle and being open to conversations is a vital communication skill that can increase emotional intelligence.

Emotional intelligence is a critical aspect of a person's development. It is essential to develop emotional intelligence to adapt to different situations and improve one's overall well-being. Therefore, it is crucial to focus on emotional awareness, self-regulation, empathy, and social skills to enhance emotional intelligence. Here, the importance of emotional intelligence appears. It is not normal for a person with little emotional intelligence to be able to develop and learn properly. Hence the importance of emotional development so that the scientific side of the person is more adaptable [40].

3.2 LEARNING WITH PLAYING

Engaging students in the learning process is an exceptional approach that not only makes education more enjoyable but also provides a platform for students to explore and practice new skills. Incorporating play into learning can encompass a wide range of activities, including games, simulations, and puzzles. These interactive endeavours serve to reinforce previously acquired knowledge while introducing fresh material.

Moreover, integrating play into learning fosters the development of problem-solving abilities, creativity, and collaboration. For instance, students can collaborate to solve puzzles or navigate through simulations, thereby enhancing their communication and teamwork skills. By applying the concept of play to education, students can also establish a deeper connection with the subject matter, as they are able to apply the skills they have acquired to real-world scenarios.

Furthermore, the incorporation of play in learning cultivates a sense of community and connection among students. This is achieved through the sharing of ideas and collaborative

problem-solving. By engaging in play-based learning, students not only enhance their academic growth but also develop a strong sense of other by sharing information.

Learning through online gaming: playing games can be an effective way to enhance learning. Video games, for example, can help develop reading skills, logical thinking, visual and spatial awareness, and even geographical knowledge through the locations featured in the game. Additionally, gaming can also improve social skills and a foreign language proficiency by allowing players to communicate in multiple languages. However, it is important to note that there are also negative aspects to learning through gaming, such as addiction and aggression [41].

Role-playing is a type of interactive learning that is particularly effective for elementary school children. By assuming different roles in educational activities, children can learn and teach their peers, using scientific terminology and concepts in a natural and engaging way. For example, students in a math class can represent shapes to convey the concept of three-dimensional objects. Role-playing has a positive impact on students' personalities, creativity, and confidence, and feedback on this type of learning has been overwhelmingly positive and useful for students. Assigning homework that requires research after class by using website searches can also be an effective way to promote individual learning and professional development. By encouraging students to explore topics on their own, they can gain valuable experience and knowledge that can be applied in social situations [42].

Studies have shown that games have a positive impact on student learning through participation in tasks that are presented in English. This allows them to learn new vocabulary and terminology, which in turn builds their confidence and reduces unnecessary anxiety during the learning process. Fear is often the first obstacle that students face when trying to learn, and it can hinder their ability to connect with their environment, with the importance of taking into account the individual differences of students [43].

In fact, there were differences observed between two groups of students. The first group played a game that involved shapes, geographic locations, and specific tasks to be completed within a set time frame. The second group received traditional instruction without the benefit of prior knowledge gained through games. The results showed that the first group performed better than the second group, as they were motivated to learn and were not burdened by

anxiety. This is known as "providing prior knowledge" and is a key factor in successful learning [44].

In general, online gaming can be a powerful tool for learning, but it is important to be aware of its potential negative effects. Role-playing and individual research can be effective ways to enhance learning and promote personal and professional growth. Understanding the significance of prior knowledge is crucial in aiding students to comprehend and enhance their scientific and practical skills [45]. Incorporating play into the learning process is an effective and enjoyable method that not only reinforces knowledge but also nurtures problem-solving skills, creativity, and collaboration. By applying learned skills to real-world situations, students can establish a deeper connection with the subject matter. Additionally, play-based learning fosters a sense of community and connection among students, promoting a collaborative and supportive learning environment.

3.3 SOFTWARE SYSTEM ARCHITECTURE

In order to develop software, it is essential to have knowledge of system architecture. Building a system without understanding the available memory, data size, processor size, and program complexity can result in different system structures. Some systems require larger storage capacity, while others need continuous operation without interruption. Some systems require distributed units across different countries, while others need permanent copies and enhanced security measures. Therefore, there are various forms and methods of software development.

3.3.1 Type of Building the Program Systems

- i. Layout patterns,
- ii. Client-server patterns
- iii. Micro services patter:

There are various types of building program systems, depending on the specific requirements and goals of the project. Three common approaches are layout patterns, client-server patterns, and micro service patterns. Layout patterns involve organizing components into specific grid structures to enhance usability and visual appeal. Client-server patterns distribute processing tasks between a server and multiple clients to maximize scalability and

efficiency. Micro service patterns employ small, self-contained services that work together in a cohesive system, allowing for greater flexibility and easy maintenance. Choosing the ideal pattern for your program system is vital in achieving optimal functionality while ensuring consistent performance and user satisfaction. Each pattern has its unique strengths and weaknesses, which must be thoroughly understood before deciding on the most suitable approach for your project [46]. But some of the most important ones include [47] [48].

- i. **Layered Architecture Pattern:** This type consists of four basic units, including the presentation layer, application layer, business layer, and data layer. The first layer is the interface that connects with the user, while the last layer is the database part to execute a specific task. Passing through the four layers leads to displaying the information in the first layer. The codes of each layer are isolated from the others, so modifying the codes in one layer does not affect the others.

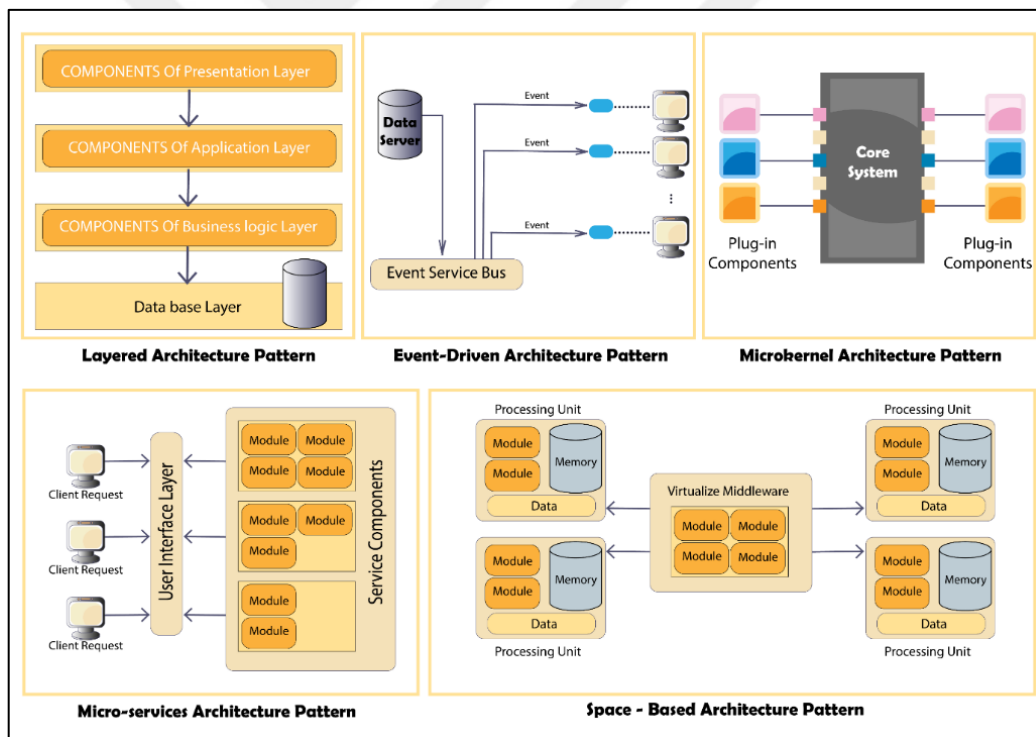


Figure 3.1: Some Type Of Software System Architecture.

- ii. **Event-Driven Architecture Pattern:** occurrence of an event Single-purpose event processing components working in synchronization with something happen when it to

change happened on the architecture of the program, as unit added to the basic system. A good example of this is creating an e-mail account or creating a Facebook account.

- iii. Micro-Kernel Architecture Pattern: This pattern consists of a single core and several software add-ons, such as adding sound to an application. The add-ons are rules or more complex cases added to the system.
- iv. Micro-Services Architecture Pattern: This pattern consists of small parts that work together to form a single unit. The information is transferred to the user upon request.
- v. Space-Based Architecture Pattern: This pattern consists of small systems that contain memory and a small processing unit, but are connected to a larger computer system known as Virtualize Middleware.

It is crucial to understand these patterns and methods to develop software efficiently and effectively. By doing so, developers can create software that meets the specific needs of users and businesses.

3.3.2 Streaming Protocols

When it comes to transferring data, it is done in a sequential manner through various streaming protocols. These protocols include:

- i. Peer-to-Peer: This is similar to making copies of a program. The data is transferred directly between the users without the need for a central server.
- ii. Unicast Protocol: This protocol involves a central server and a number of users. When a user requests data, it is sent from the source or main server to that specific user. However, this type of protocol can face issues when there is congestion on a particular type of file.
- iii. Multicast Protocol: This protocol also involves a central server and a number of users. However, the data is sent from the source to all users at once, regardless of whether they need it or not. This can result in some users receiving unnecessary copies of the data.

After discussing some of the computer system architectures and data transfer methods, it is essential to understand the user's requirements to design a project based on their needs. This ensures the reliability of the system.

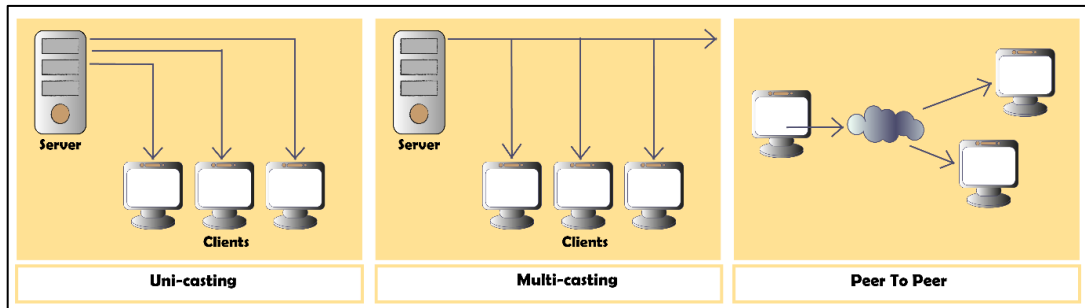


Figure 3.2: Type of Streaming Protocols.

System dependability depends on four elements: Availability, Reliability, Safety, Security. The first element availability is the ability of the system to deliver the service whenever you request it, the second reliability is the work of the system and its ability to deliver the service as required, its ability to work despite the existence of obstacles and errors, and this is what is known as fault avoidance , As for the next element the safety is the work of the computer system, despite the failure of a specific part or unit of the units, and the state of safety is important in certain systems, such as systems for administering heart or sugar medications. The delay in a certain dose of medication affects the patient's life. This is what is known as High safety and reliability, the last Security is to protect the computer system from any intruder from the outside that might disrupt its work, especially in cases of using programs via the Internet. Wide world wide (WWW) It is possible to maintain the security of information by adding a username and password or adding encryption to the data [49] [50].

3.3.3 Create System Learned for Kids

As technology keeps advancing, it keeps offering better solutions to tackle our everyday problems. And one of the biggest challenges in the education sector is finding effective ways to help children learn. That's where Python Tkinter comes in, a fantastic addition to modern educational tools. This system is designed to make learning new concepts easy and enjoyable for kids, allowing them to interact with the material in a fun and engaging way.

Python Tkinter is a library specifically created for building user interfaces in Python. It offers a wide range of tools and functions that are incredibly useful for developing interactive educational systems. By using Tkinter, developers can create educational platforms with all features. They can combine graphics, audio, and text, add animations, shapes, and colours –

the possibilities are endless! This framework empowers children to develop visual learning tools that help them grasp complex ideas in no time [51].

But that's not all! With Python Tkinter, developers can also create educational systems that adapt to the unique learning needs of each child. The system can keep track of a learner's performance during their study sessions and use that data to modify the learning material accordingly. For instance, if a student demonstrates a high level of comprehension, the system can increase the difficulty level to keep them challenged. On the other hand, if a student needs more time to understand a concept, the system can adjust the pace of the learning material to ensure they grasp it fully.

The flexibility of Python Tkinter makes it the perfect tool for developing comprehensive educational systems that cover a wide range of subjects. Teachers can harness the power of this system to create courses that are not only educational but also fun. They can incorporate subjects like math, science, and language, making the learning experience more engaging and enjoyable for students. Additionally, the system can provide interactive quizzes and tests that offer immediate feedback, helping learners gauge their progress.

The use of gamification in educational systems helps engage children in learning activities. Developers can use Python Tkinter's libraries to create games that require children to learn particular concepts. For instance, a math game that asks children to solve equations by clicking on the correct answer. Children will not only have fun playing these games but also learn without even realizing it.

Finally, the system developed using Python Tkinter can be adapted to work on different platforms, such as desktop, tablets, and smartphones. This adaptability means that learners can access the learning material from anywhere, at any time, making learning more convenient. Learners can learn at their own pace without worrying about being left behind.

In conclusion, Python Tkinter has numerous benefits, making it a great tool for creating educational systems aimed at children. Its flexibility, adaptability, and versatility make it an important addition to the educational landscape; it is a tool with the potential to enhance educational outcomes significantly. The use of Python Tkinter educational systems enables children to learn new concepts, develop their skills and knowledge, and benefit from an educational experience that is both enjoyable and effective. The next step is for educational

institutions to embrace this technology and incorporate it into their educational systems [52]
[53].



4. FOURTH CHAPTER

4.1 TYPE OF MULTIMEDIA

In our daily lives, we use various forms of multimedia through our phones or by watching television or any other device. These forms of media can be divided into two categories: static media (*text, graphics, images*) and continuous media or moving media (*audio, animation, video*). Each of these categories has its own types and can be handled through processes such as generation, manipulation, storage, presentation, compression, transmitting, communication, and retrieval of data/information and so on other processing [54].

When designing anything, there are several design considerations that must be taken into account. If these considerations are taken into account, the connection between the design components will be well-represented to convey the required information in the easiest way possible. For example, the font size and type must be appropriate, especially for the title, and the image should be centred with the title above and below it, with the rest of the text in a smaller font than the title. The image can be placed on the right or left side of the text to highlight the element that needs to be focused on within the design. We may use one or two colours to distinguish the writing from the rest of the design [55]. Regarding writing, using a bold font for titles while considering the type of font is essential. From that some of consider the properties that we must need to be taken into account in the *font*, such as types, styles, kerning, leading, size, colours, and special effects like 3D, glowing, reflection, underline, and shadows. The type of font affects the design, whether it is pixels (monitor resolution) or points (from the printer). The former is a square matrix, while the latter is from the printer.

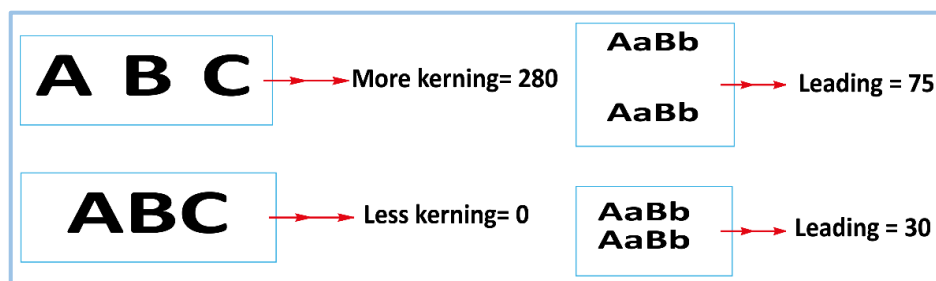


Figure 4.1: Some Font Properties.

As for the *image*, it can be raster (image bitmap) or vector (graphics). The former is a matrix consisting of sequential locations of columns and rows and can be monochrome or coloured. The other type requires only a starting and ending point and can be filled with colour or just outlined. These simple shapes serve as the foundation for more complex forms. By utilizing operations such as *addition*, *subtraction*, *intersection*, and *union*, these basic shapes can be transformed into entirely new shapes. Additionally, through the use of binary shapes, it is possible to generate three-dimensional shapes by merging them together. This process allows for endless possibilities in the creation of complex and intricate designs [56].

	Unite	Subtract	Intersect	Exclude
2 Circle				
3 Circle				

Figure 4.2: Some Operations In Samples Shapes (2 circle, 3 circle).

When it comes to selecting colours for images, there are two main types to consider: RGB and CMYK. RGB relies on the primary colours of Red, Green, and Blue, which can be combined to create secondary colours like Green, Violet, and Orange. These secondary colours can then be combined to create tertiary colours. Each individual colour is referred to as a hue, and has its own level of saturation or lightness. CMYK, on the other hand, uses four colours: Cyan, Magenta, Yellow, and Black. This type of image is particularly useful for printing [57] [58].

To create a visually appealing design or photograph, it's important to consider different colour schemes. These can include monochromatic, analogous, complementary, split complementary, tetracycline, and square colours. By following these standards, designers can ensure that their work is effective and clear. In addition to these colour schemes, photographers should also keep in mind certain tips for creating a good design. This can include using the colour wheel to find contrasting colours, by using a pop colour, creating abstract photos, using bright and colourful backgrounds, understanding dominant colours, and following the thirds composition rule [59].

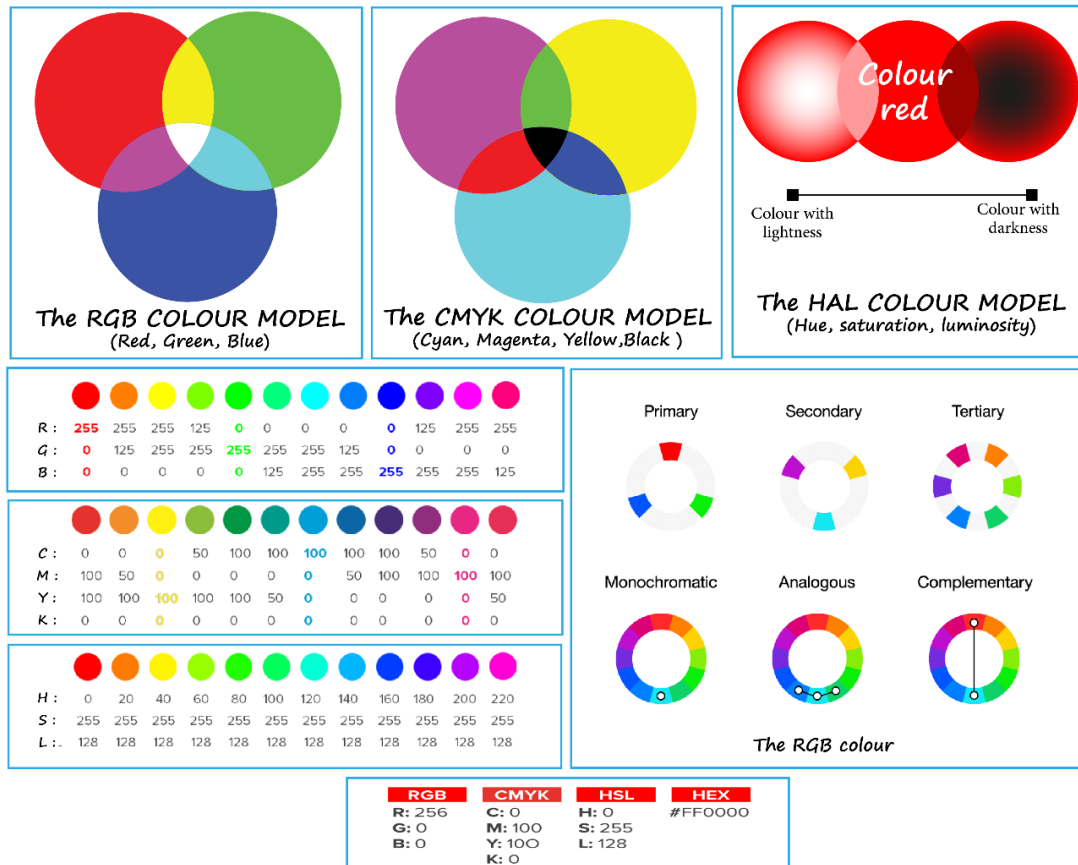


Figure 4.3: The RGB, CMYK and HSL Model Colours.

By following these guidelines, designers and photographers can create stunning images that are sure to capture the viewer's attention. In order to effectively utilize colour in design, it is crucial to understand the appropriate colour spectrum and how to choose colours that complement one another. Once this understanding is achieved, the final step is to apply this knowledge to real design. This can be accomplished by utilizing the colour wheel and its various combinations. For instance, if the objective is to highlight a specific part of an image, it is important to select a hot colour with a lightness that matches the rest of the image. Additionally, the size and placement of the highlighted area should be considered, with the central location being the most effective for drawing the viewer's attention [60].

In general, the size, colour, and placement of an image's elements are all crucial factors in highlighting specific areas and directing the viewer's focus. By utilizing the various combinations available on the colour wheel, designers can create visually appealing and effective designs.

Various types of image file formats exist, each with its unique features and applications. JPEG or JPG (Joint Photographic Experts Group) is a raster image file format that uses lossy compression, making it ideal for sharing images. PNG (Portable Network Graphics) is another raster graphics format, while GIF (Graphics Interchange Format) is a raster file type that uses lossless compression but limits the image to 8 bits per pixel and a palette of 256 colors. GIF is popular for animated images due to its 8-bit limitation, which keeps file sizes small and internet-friendly. Switching from JPEG and PNG to WebP can help save server disk space and significant bandwidth, with up to 35% smaller image files for identical quality. TIFF is a professional graphics format that does not use compression, making it ideal for applications such as Photoshop and Illustrator. BMP (Bitmap) and SVG (Scalable Vector Graphics) are two-dimensional image formats that render directly within the browser. EPS (Encapsulated Postscript) is a vector image file used for storing illustrations in Adobe Illustrator and other illustration software like CorelDraw. PDF (Portable Document Format), PSD (Photoshop Document), AI (Adobe Illustrator Artwork), INDD (Adobe InDesign Document), and RAW file types are digital camera formats used to store full-quality images for later post-production and editing. Understanding the various image file formats available can help you choose the right format for your specific needs [61].

Virtual reality can be created using graphics to produce a fantastical environment. This type of program requires a basic background to create graphics that provide a more accurate virtual reality experience. Despite the existence of techniques to link body movement with graphics, achieving a more accurate form requires continuous work on the animated graphics [62]. There are several types of animation, including 2-D animation, which generates images through static pictures. 3-D animation, which adds mathematical processes to display graphics in three dimensions. Motion graphics add movement to graphics or text, while Transformations change the colour or specific parts of the graphics to create a moving effect. Stop-motion animation involves a stationary image while the surrounding environment moves, giving the impression of movement [63].

Animation has a significant cognitive impact, making it an easier way to explain scientific or mathematical concepts through simulated visual experiences. The movement of graphics attracts attention and provides a more contemporary approach to explaining complex ideas [64].

The Sound is a continuous signal that is converted into a digital signal, convert from Analog to Digital, to be processed by a computer and possibly transmitted through media using an encoder and decoder. Sound waves come in different types, such as high or low frequencies, and the frequencies that humans hear differ from those that animals hear [65]. Certain frequencies, known as speech signals, range from 50-10 Hertz and are only audible to humans so we cannot hear the higher or lower from that. Children can hear more sounds than adults due to their better hearing ability. Sound waves have various properties, including Frequency, which fades over time in a specific medium like air, and periodic and aperiodic signals that repeat or do not repeat within a certain time frame. Amplitude refers to the intensity of the sound, such as the height of the wave, which can be 5 or 10. Phase refers to the beginning of the wave, which can be 0, π , or $\pi/2$. Several factors can affect sound waves, such as distortion, noise, and attenuation [66]. When transmitting data, sound may need to be encrypted to prevent tampering in certain situations.

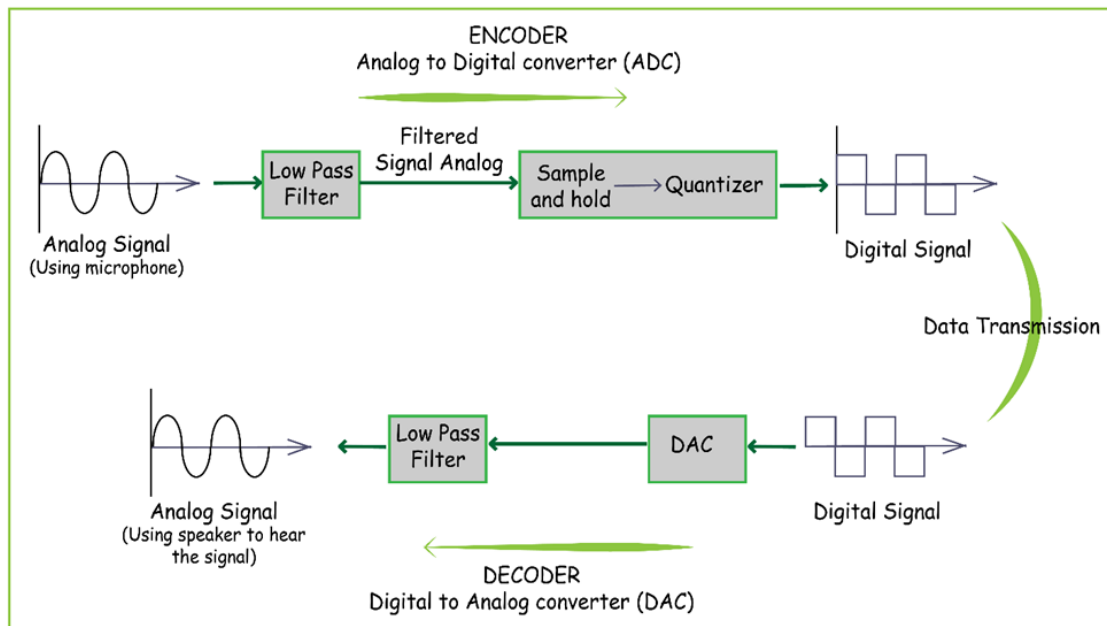


Figure 4.4: Encoder and Decoder Operation For Transmission Sound.

On the other hand, Video usually consists of repeated images that move quickly, captured by a camera. There are different types of videos, such as HD (720×1280 pixels), FHD (1080×1920 pixels), 4K (2160×3840 pixels), and 8K (4320×7680 pixels).

4.2 THE RESULT OF THIS THESIS

The research project began with an idea and two objectives. The first objective is to enhance traditional education by incorporating elements that make it more flexible and learner-centered, so that students do not feel like they are being tested. The second objective is to focus on the emotional aspect of learning and attempt to increase human intelligence in this area.

After studying several similar sources related to the idea, it became evident through previous discussions within the research project that the emotional aspect is crucial in learning and effectively conveying information. Alongside emotions, the way information is presented and delivered by teachers plays a significant role. Teachers are indispensable in this process, as they have the greatest influence.

To be more precise, there are rare cases of self-learning, but these are uncommon in the early stages of education. In the early stages, education heavily relies on teachers to impart knowledge. Based on the research reviewed, human intelligence develops and accumulates throughout different stages of life. The more one learns, the more information is stored in memory. Human intelligence is like a mental muscle that needs to be exercised and increased awareness and knowledge during various life stages. This does not negate the fact that individuals may inherit certain genetic traits related to intelligence from their families. However, the level of intelligence can be altered throughout life stages by focusing on the quality and not the quantity of education. A learner may gain more from a single innovative and interactive lesson than from ten conventional lessons. The teacher has the ability to expand the student's imagination through thought-provoking questions.

Undoubtedly, there are individual differences among people, and the same applies to learning. Therefore, parents and schools should pay attention to the general and specific inclinations of learners, especially children, in order to develop and work on their interests. It is important to emphasize the significance of allowing children to experience various activities to determine their preferences and then focus on developing those preferences later on.

The objective of this research is to develop an interactive educational program tailored for young learners, specifically children under the age of six, commonly referred to as

kindergarten age. We believe that, the most important age for education is that age, in addition to the difficulty of please them as they possess a candid nature that demands utmost satisfaction. Either they embrace a project and actively engage with it, or they swiftly discard it. Consequently, we recognized the need to design an interface that resonates with children, characterized by simplicity, vibrant colours, large images, text compact size.

To accomplish this, we opted to utilize the Python programming language for creating the graphical user interfaces (GUI). Python, with its extensive capabilities for programming buttons and graphics, emerged as the ideal choice. Within the Python ecosystem, we specifically selected the tkinter and flet libraries due to their flexibility in facilitating testing. These libraries offer a range of pre-built functions, including essential widgets such as Entry, Combo Box, Text, Button, Label, and Radio Button.

By employing these tools and techniques, we aim to develop an educational program that not only captures the attention of young learners but also effectively facilitates their engagement and learning experience. Our research endeavours to provide a seamless and enjoyable educational journey for children in their formative years, setting a strong foundation for their future academic pursuits [67].

During the practical aspect of the research, an interactive educational system was programmed. This system consists of a set of questions that rely on memory retrieval, visual colour discrimination, and auditory and motor skills. Additionally, it aims to teach children some basic emotions such as joy and sadness. The answer methods varied, including multiple-choice questions with four, three, or two options. The answer can be entered through an input field or selected from multiple choices. The result for each question is displayed, indicating whether it is correct or incorrect. In case of an incorrect answer, an interactive and motivational phrase is added, such as "playing some sports" to prevent the child from getting bored due to the length of the questions. The main objective of this project is to encourage children's interaction with the questions.

Through asking questions, the importance of prior knowledge in children and the significance of the questioning method become evident. Initially, it was challenging to capture the child's attention and break the barrier that this was not a test but merely a game. However, as the questions progressed, we observed their interaction with colours and shapes.

Most children showed an attraction to video questions, and their responses to this type of question were better than the rest. Additionally, quicker response time to these questions.

The questions vary, ranging from high-level questions to lower-level ones, in order to assess the natural intelligence of children. After conducting the test for children, a final test result is obtained. Following this, an interface connected to a database appears, where certain information such as the child's name and age is entered to obtain additional information for the questionnaire. This information helps determine how to improve and develop the intelligence quotient and its progression through repeated testing. It also aids in understanding the children's preferred learning methods and the type of questions that resonate with them. It is possible to open the database separately to handle data and search for test results. Additionally, it is possible to link the database to a larger database that connects multiple rules, with the main database being accessible only to the school or nursery manager, or the responsible person. The database linked to the test can be an internal database accessed by the direct teacher working with the children. In both cases, a username and password can be added if necessary to enhance the security of the test-generated data.

In order to test the project, samples were taken from children aged between 3 and 7 years old, boys aged 9 to 11, young adults aged 23 to 39, and adults over 50 years old. The results of the samples varied from one age group to another, and the method of asking questions differed as well. For the youngest age group (children between 3 and 7 years old), three to four children were taken together to help each other and make the task feel like a game, so they wouldn't feel stressed while solving the puzzle. The first question directed to the children was, "Do you like to play games?" as playing is closer to their interests. Most of the children agreed to take the test quickly, with enthusiasm to see how they would play. There were a few rare cases where children initially refused to play due to personal circumstances. It was observed that there was a noticeable interest from the children, confirming that the test was perceived as a game for them. This helped the children who initially refused to take the test to join in later with subsequent groups. Here, the surprise was that those who were less talkative and had less communication showed greater and more cheerful interaction with the test. However, it should be noted that the questions were presented in an entertaining manner rather than a coercive one. Their answers were closer to being correct, indicating

that those who faced difficulties or considered themselves special cases were more intelligent and reaction to the test.

Through the questions, it was observed that children have a greater understanding of feelings of sadness and anger than feelings of joy and surprise. Most children responded to the image of the person with an expression of sadness, while surprise was less familiar to them. This could be due to the fact that they have experienced sadness more frequently in their daily lives than joy. As for the question about sound, it was not noticed that children were attracted to it because the teacher compensated by explaining the questions. Here, the role of the teacher in presenting the lesson and information stood out, as the primary goal was for the child to learn more. Therefore, it was the responsibility of the teacher to present the question in the easiest way possible, according to the child's level. Each case requires a specific approach, highlighting the teacher's ability to convey information in the correct and easiest way that will be ingrained in the child's memory for future retrieval. As for the video or animated image questions, children showed more interest in them compared to the other questions, and their answers were mostly correct. The diversity of the questions was taken into consideration, as some were suitable only for a specific group, while others were more challenging. The purpose of presenting difficult questions to young children was to determine if there were any Intelligence mutations. Attention was given to memory recall, concentration, and observation. Some questions contained simple tricks that could deceive a person. The questions also varied in nature, allowing us to determine if a person possessed quick wit or better thinking skills. Some individuals focused on finding the answer and took more time, but had a higher probability of finding the correct answer. The importance of time in selecting the correct answer was also important, the faster child with a correct answer has more luck than the slower one.

During the test, the age group, linguistic background, specialization, and learning level of each individual were taken into consideration. It was observed that there was a difference between children and adults in terms of their linguistic proficiency, and the importance of this was highlighted in terms of their ability to answer quickly and read the question without assistance. After comparing the answers of the younger age group with the adults, it became apparent that there was equality in terms of percentages. However, the surprising finding was that the age groups between adolescence and adulthood had higher and more accurate

results. From this, it can be concluded that the human mind acquires numerous experiences, or what is known as information, during its early stages of life until young adulthood. These pieces of information are stored in the brain and reach their peak during the young adult stage. Similar to any other organ, the human mind undergoes full development during the stage of young adulthood and maturity. This highlights the importance of learning and focusing on the quality of learning, as increasing the quantity of acquired information during the learning process, alongside human genes, reaches its peak after completing higher education. Consequently, the human mind, like the rest of the body, begins to decline during the aging process. However, it is important to note the influence of the type of games on understanding the nature of the questions, as observed in the age group between adolescence and young adulthood due to their exposure to games. As for the language proficiency, there were individuals who were unable to find the correct answer due to their inability to read without the assistance of a teacher. On the other hand, individuals with language proficiency had answers that were closer to being correct.

4.3 SEARCH AGE GROUPS AND RESULTS FOR EACH AGE GROUP

The questions covered a number of topics, including:

- a. Questions about the movement, which included (four questions):
 - i. Change one form to another after pressing the button (2 questions)
 - ii. Change one colour to another after pressing a button (2 questions)

The aim of these four questions was to note the memory, the speed of the answer and the concentration, so the place of this group of questions was at the beginning of the test.

- b. Questions about sound, which included (four questions):
 - i. Hearing a voice and the answer is based on the voice heard (2 questions)
 - ii. Hearing a voice, and the answer is based on the previous information of the listener, and the purpose of the voice here is only to camouflage the listener (2 questions)

The aim of these four questions was to test the learner's sense of hearing, test his concentration, and the speed of returning information from memory, based on previous knowledge.

- c. Questions about feelings and emotions, which included (four questions):
 - i. A picture of a single boy and girl (2 questions)

- ii. A picture of four pictures, each picture has a state according to the sequence of feelings (angry, surprised, sad, and happy)

The aim of these four questions was to know the feelings and how the person interacts with the image by observing the person's interaction with each feeling in order to be able to acquire feelings and experience them, which helps in social communication, and the images of these questions were drawn by using the graphics program Adobe Illustrator because it provides a vector image, so it is more clarity.

- d. Questions about the pictures and the power of observation included (10 pictures)
 - i. Questions about the power of observation with thinking (3 questions)
 - ii. Questions about a missing part, we choose one of the four options (5 questions)

Questions about the arrangement of the picture (2 questions)

The aim of this group was to know the individual differences, although there were intelligence mutations, because this group was developed in a way that may seem easy, but it has a nature that requires the strength of observation and focus. And it appeared in this part the importance of previous knowledge for those who conducted the test more than once, and also the importance of electronic games because a lot Many games contain such questions, but in different ways. Also, pictures of these questions were drawn by using the graphics program Adobe Illustrator.

- e. Questions containing animated pictures (2 questions)

The aim was to know the extent of the learner's concentration and memory. During this type of question, it was noted that the memory stock of another language was taken advantage of by reading the question and answering it before showing the video, and this is what is considered part of the intelligence acquired during life. As for those who did not have a language stock, they relied on His focus and observational power.

In general, the age group of children preferred the questions that contain movement and video over the questions of pictures, because they love to play and consider it playtime and not a test. As for the rest of the age groups, there was a difference in what they preferred, and this indicates that each person has a specific orientation according to what he likes and dislikes during the stages of his life, but in Mostly, the video was closer to the people than the sound and the image.

4.4 THE TEST USING TWO DIFFERENT GROUPS OF PEOPLE AND THE RESULTS OF THE TESTING IS

4.4.1 First group of People Who Testing

Samples were taken from the ages of 3-7, and their results were closer to the older age groups who are over the age of 40. As for the higher age groups, the results were between the ages of young and late youth, according to the following table 4.1:

Table 4.1: Showing the Results Of First Group Testing.

Sequence	Name of the age group	Age	Pictures results	Motion output	Audio results	Feelings results	Video results	Rate of results
1	Junior	3-7	6out of11	3 out of 4	2out of 4	2out of 4	2out of 2	20-15
2	boy	7-12	9out of 11	3out of 4	3out of 4	4out of 4	2out of 2	22-21
3	youth	22-30	10out of 11	3out of 4	3out of 4	4out of 4	2out of 2	24-22
4	Late Youth	30-40	11out of 11	2out of 4	4out of 4	4out of 4	2out of 2	23-21
5	old people	Older than	6out of 11	3out of 4	2out of 4	3out of 4	1out of 2	20-15

4.4.2 Second Group of People Who Testing

The test and questionnaire were administered to the students and the teacher at the same time in a typical primary school that uses interactive learning in below-school grades: kindergarten and pre-primary grades, ages four to five years, the second grades of primary school, ages seven to eight years, and the fifth grades of primary school.

The topic begins with a questionnaire asking the students: Do you like to play a game? Do you prefer to study via computer? Do you like to watch a video or photo? The interaction of most students begins. Then we continue asking them survey questions. After completing them, they are asked a question: Do you like to play a computer game? Most of the answers are strongly yes. We ask the test questions and explain them to the students, with the help of the teacher. The answer continues until the result appears, and then I obtain age and name information from the students. In the end, the students' interaction and acceptance of the

topic was great to an astonishing degree. The questionnaire was tested on a group of teachers and the results were close to the first group in terms of the test result, according to the following table 4.2.

Table 4.2: Showing the Results Of Second Group Testing.

sequence	Name of the age group	age	Rate of results
1	Junior	4-7	13-20
2	Boy	7-12	15-23
3	Late young	30-40	20-23
4	Old people	40-50	20-21

The benefit of these questions is to direct students' attention to knowing the importance of the correct answer, but on the condition that it is also correct, knowing colours and some facial expressions, and how to empathize with them, developing their speed of intuition, operating the mind, and the importance of linking the sense of hearing and sight together, in addition to movement, for faster, more consolidated, and interactive learning for students. Under the guidance of the teacher, who has a major role, the students' love for the teacher and their friends in the classroom is a great motivator for learning, which shows the importance of learning in the classroom, but in more interactive ways, i.e., what is known as interactive learning combined between e-learning and traditional education, i.e., learning from the book, with the importance of having at least one class during the course. During the week, the students learn from each other, and a student from among the students, with prior guidance from the teacher, plays the role of the teacher to deliver the information in a second way after learning it first from the teacher. There was also a discrepancy between the opinions of the students, some of whom preferred to learn from the teacher and some of them preferred to learn from family or friends, but in most cases They preferred to learn from the teacher, in addition to that they preferred to learn with a group within a class instead of distance learning or what is known as e-learning. This is based on the type of education. As for the form of education, do they prefer education through an image, video, sound, or movement form? There is a discrepancy between opinions. According to age, the primary grades and pre-school age preferred video to sound, movement, and playing with learning.

As for the older grades, they did not mind seeing a video or picture, but they preferred playing electronic games of an educational nature, as they learned a foreign language, new words, websites, and strategic thinking from them. New and here was the surprise in their desire for tests, whether paper or electronic, because they are familiar with the subjects and most of them have good general information for their age and are looking forward to acquiring more information outside the framework of the lesson.

4.4.3 Comparing Between the Two Results

To compare the results of the first and second tests, the results were close in percentages, with late youth having the highest results, which confirms that the human mind is at its peak of intelligence in late youth, and most of the information is acquired either from the surrounding environment or from learning within school, and certainly it was monitored. A number of mutations for young ages, and this is the basis of the research. Its main goal was to know these mutations in the speed of the answer and at the same time its accuracy. The focus was on how the correct answer was taken. It was noted that there are solution methods that help in finding the fastest solution, and this point depends on the person, how intuitive he is to find. The solution is as quick as possible, even though there is a difference between the ages. The following chart shows the results for the first and second groups and the comparison between them. It shows the age at which a person’s concentration and activity peak, and it also shows the ages at which these decreases.see the details in charts 4.1and 4.2.

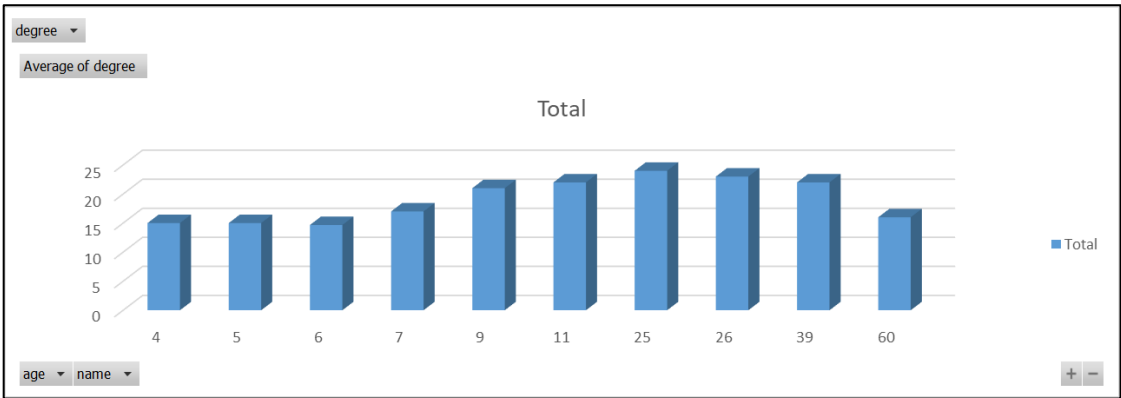


Chart 4.1: Showing The Results Of First Group Testing.

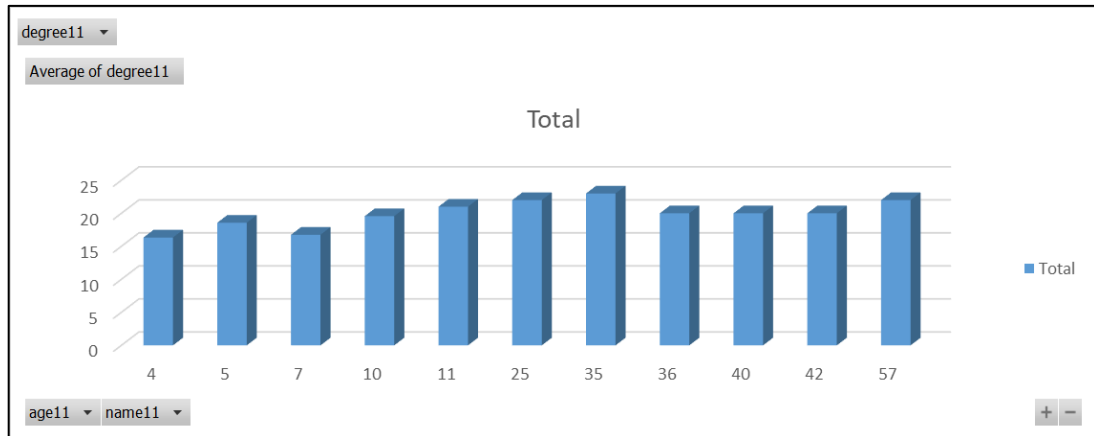


Chart 4.2: Showing The Results Of Second Group Testing.

The results test was completed to find the ages with the highest percentage, using graphic charts to illustrate the percentage of average scores for each group separately to show the difference. The results for the two groups were very close, and this proves the validity of the research, noting the presence of intellectual mutations between the percentages, which proves that the test succeeded in finding this. To clarify this idea, we notice the difference. In the presence of a small number of young people who have a high rate or high result compared to their peers, and the same is true for the elderly, there may be mutations depending on the nature of the human environment and how he maintains his mental activity. Therefore, research proves that the human mind needs to learn permanently in order to reach the stage of Good intellectual education. This is what is known as continuing education or prior education. To note the difference between the previous two plans, two pictures have been included 4.5 and 4.6 Shows a grading chart for the different ages tested.

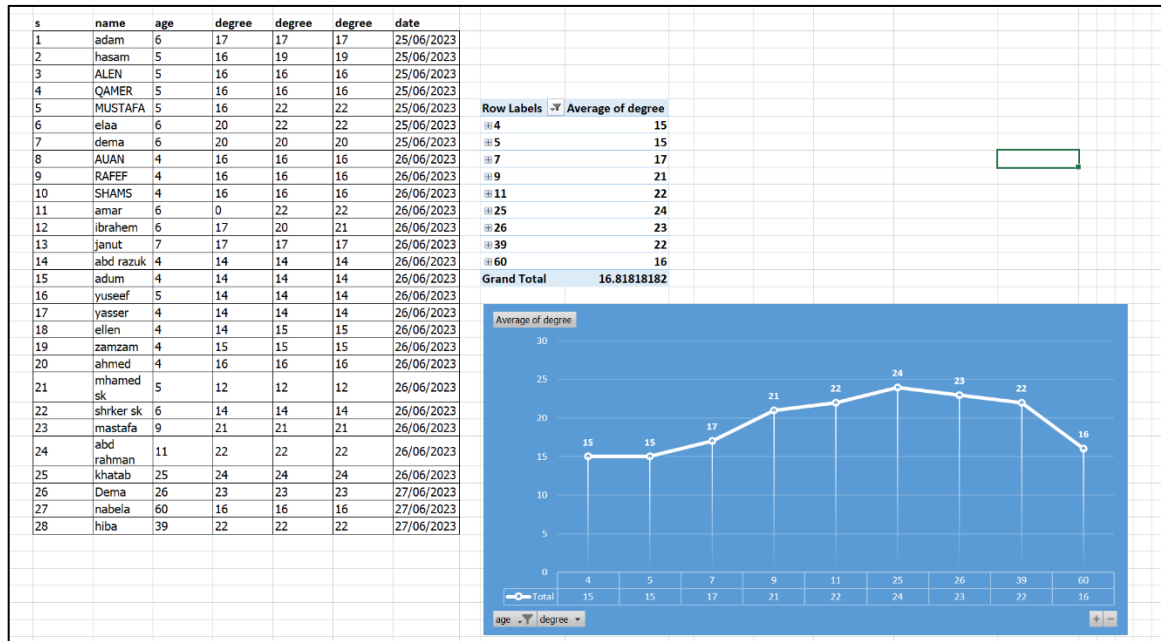


Figure 4.5: Flowchart And The Data Of Group One.

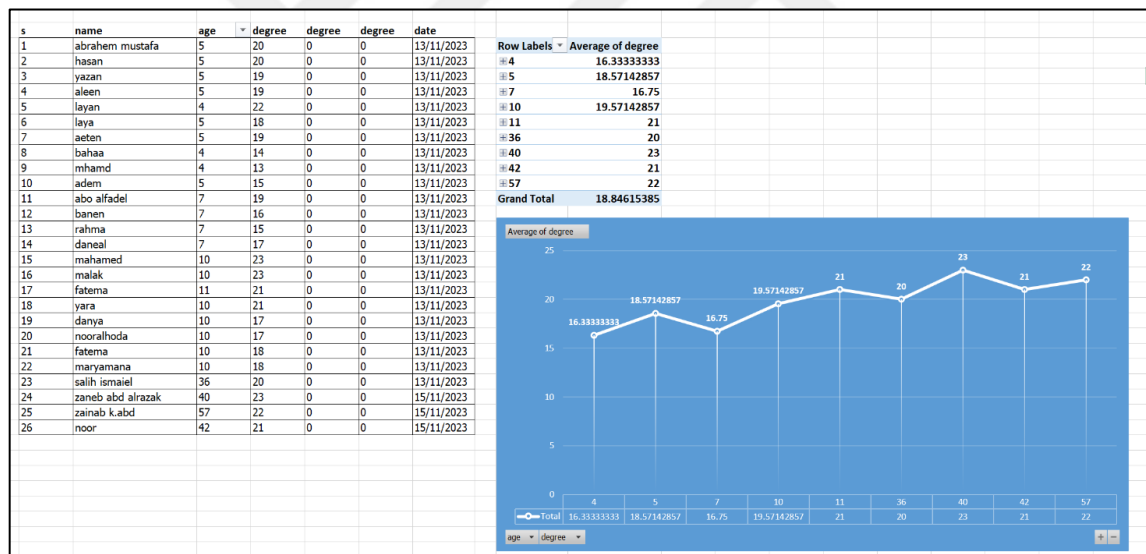


Figure 4.6: Flowchart And The Data Of Group Two.

At the end we must comparing our work with other related work that we focus on in the first chapter of this project and to display that we using three tables in numbers 4.3,4.4,4.5. every one of three tables contain different features the first table focusing on: education, E-learning, SML, find new way to learn, effective learning. The second table focusing on: focus on emotional, intelligence, knowledge, game, computer. The last on and the third is about: special cases, intelligence mutation,

generate questions, result, easy learning. And showing the years of related work and in the end rows of summary about the work.



Table 4.3: Showing The Comparing Between Ours Work With Related Work In Features Of:

Focus On Education, E-Learning, SML, Find New Way, Effective Learning

Reference	year	List of related work	Focus on education	Focus on E-Learning	System management learning	Find new ways to learn	Effective learning	Summary
[2] V. Vagale	2018	First related work						Focus on electronic education and personal information, and the architecture of system main parts.
[3] P. Chatwattana	2018	Second related work						Display the challenges of interactive and self-learning by active or non-active learn
[4] B. León-Del-Barco	2020	Third related work						Emotional intelligence is growing requirement
[5] C. Y. Lee and M.-J. Chen	2014	Fourth related work						It is about the prior knowledge by using gaming, libraries or whatever
[6] J. C. Yang and B. Quadir	2018	Fifth related work						Focus on the goodness of using gaming
[7] A. N. Yousef	2022	Sixth related work						Input information and get results help the sense student of hearing
My working	2023	My working						Focus on effective learning with moving by using different type like prior knowledge and gaming

	Provides search feature
	Feature is not available

Table 4.4: Showing The Comparing Between Ours Work With Related Work In Features Of:
Focus On Emotional, Intelligence, Knowledge, Game, Computer.

Reference	year	List of related work	Focus on Emotional intelligence	Focus on intelligence of students	Prior knowledge	Using games	Using computer	Summary
[2] V. Vagale	2018	First related work						Focus on learning without the interactive
[3] P. Chatwattana	2018	Second related work						Focus on learning by connecting the students with each other and with his teacher
[4] B. León-Del-Barco	2020	Third related work						Emotional intelligence related to bullying in schools
[5] C. Y. Lee and M.-J. Chen	2014	Froth related work						Special in class of mathematics
[6] J. C. Yang and B. Quadir	2018	Fifth related work						Develop knowledge of student
[7] A. N. Yousef	2022	Sixth related work						By remember the previous working help student
7	2023	My working						Focus on all types of intelligence of student by using intelligence questions

	Provides search feature
	Feature is not available

4.5 SOFTWARE LANGUAGE USED AND LIBRARIES

The visual aspect of the program has been explained in terms of the number and nature of the questions, as well as the preferences of each category and the objectives of each question group. Now, we will present the programming language used and the types of libraries employed, as well as how the results are displayed.

Python was chosen as the programming language due to its flexibility and ease of use. It can be easily developed and allows for the addition of smaller code components in a more flexible manner. Moreover, it includes readily available and clear libraries that are easy to use. The steps involved are as follows:

- downloaded Python program version 3.12 46-bit, depending on the type of computer used, obtained from the official website python.org [68]. After that, the Visual Studio Code application was chosen to work on the programming language. Through the command prompt, after entering the Python version, the libraries were installed using the command "Pip install (the name of the library)".

4.6 THE PROGRAMMING LIBRARIES USED DURING THE PROJECT WERE AS FOLLOWS

4.6.1. Flet

This library provides easy-to-use graphical interfaces suitable for development. These interfaces are suitable for mobile, web, and calculator applications, and they are user-friendly. Before using the library, it was necessary to activate it using the command "Prompt command >>pip install flet". The general structure of the code is illustrated in the image, where buttons, text, images, animations, and even sound can be added through programming.

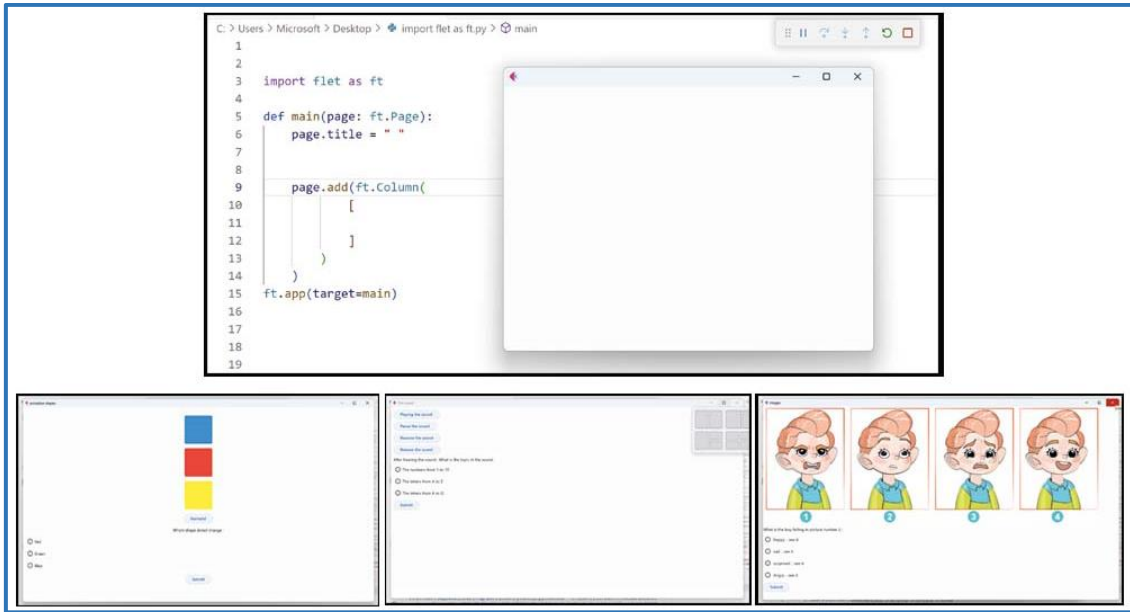


Figure 4.7: Some Frames Of Library Flet.

4.6.2. Tkinter

This is also a graphical interface that interacts with the user. Before using the library, it was necessary to activate it using the command "Prompt command >>pip install tkinter". Buttons, labels, photo images, and animated graphics (canvas) can be added through programming.

4.6.3. Other

Ready-made libraries used in the project include time, datetime, pymysql, sqlite3, math, and random. These libraries are also used to support the graphical interface.

As for the database part, it consists of two parts. The first part is specific to the teacher and is a database designed on the computer. It is connected to a larger data server, which is linked to the local host site. The computer is connected to the database server through the XAMPP control panel, where Apache and MySQL are run [69].

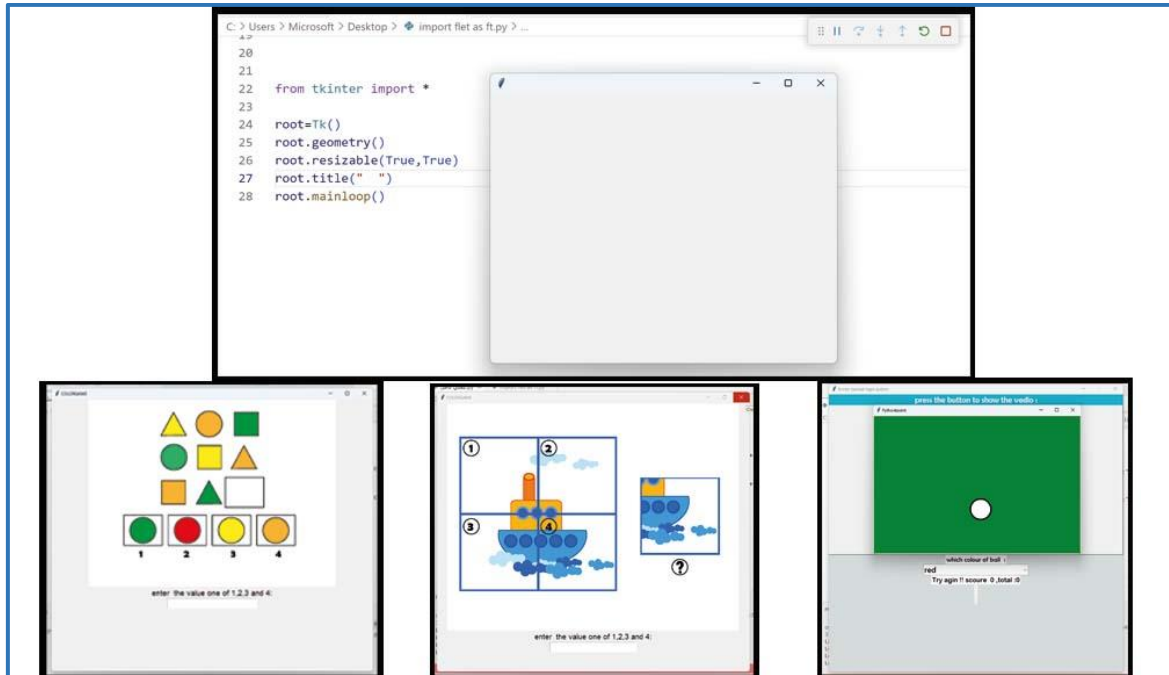


Figure 4.8: Some Frames Of Library Tkinter.

5. FIFTH CHAPTER

5.1 DISCUSSION AND CONCLUSION

To enhance this research, we can consider the following points:

- i. Incorporating an intelligent algorithm to generate questions that match the learners' thinking style and facilitate the search and development of questions.
- ii. Adding programming steps to analyse students' movements and facial expressions, which can serve as a basis for selecting the next questions.
- iii. Testing a larger sample and sorting the obtained data to increase the size of the input database for developing the questions used.
- iv. Applying the project to older age groups, which requires a more sophisticated program with a clear interface and writing control instead of relying on images and animations.
- v. Developing a mobile application for easy access and usability by students.
- vi. Adding a counter to count the times for the faster answer. And take time into account that affects in results.

In the future, by implementing these suggestions, we can improve the quality and effectiveness of the research and provide a more user-friendly and comprehensive learning tool.

5.2 Knowledgeable

Special thanks for the participation of the Farah and Marah kindergartens and school group, where a number of pre-school and primary school students participated and a number of cases related to the test experience participated. Another special thank you to the Al-Nakheel Private Schools group, where a number of second and fifth grade students participated and were distinguished by the presence of distinct cases of intelligence that led us to the desired results. Special thanks to everyone who participated in the test, including family and friends, old and young, teachers, and everyone who was enthusiastic about trying the test and was part of the project's success.

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