ASJP Algerian Scientific Journal Platform

Afak For Sciences Journal
Issn: 2507-7228 – Eissn: 2602-5345
https://www.asjp.cerist.dz/en/PresentationRevue/351

Volume: 11/ N°: 2 (2026), p 488-506

Kindergarten in the era of digitization: a forward-looking vision

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Abstract ;

This research paper tries to present a modern vision for teaching and learning in the information age through anticipating the digitization of kindergartens and transforming them from stereotypical to informatics, by moving from traditional educational programs, methods and boring teaching methods that depend on memorization and indoctrination to modern methods and techniques in an attractive scientific template that depends on understanding and thinking skills. This is achieved by integrating the computer into its programs as a strategic choice. Scientific studies have proven its effectiveness in sharpening the talents of the child and exploding his energies in a creative, unconventional way that depends mainly on computerized programs designed on scientific foundations under the supervision of an academically and professionally qualified educator working to raise the level of educational outcomes in line with the specifications of a kindergarten Tomorrow that will qualify her children for professions we do not know yet; As the world of tomorrow is the world of digitization, or rather the world of inventions in various areas of life.

Article info

Received
April 24.2021
Accepted
April 13.2022

Keywords:
- kindergarten,
- child,
- educator kindergarten,
- computer,
- computerized programs.

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1. Introduction:

The twenty-first century is witnessing an accelerated scientific and technical renaissance that brought about a technological and social revolution, which covered the world with a vast network of communications resulting in patterns of behavioural concepts and values that are effectively impacting the various aspects of private and public life - some have called this "the era of determinism" (Lotfi Barakat, 1998, p12), something one can neither refuse nor choose.- The use of information technology has reached a point of no return, in the sense that its development is rapidly and continuously moving further to an extent that has become a natural environment for all human professional and recreational activities (Steven. C and others, 2018, p14)., leading to major changes in dealing with most of today's activities and occupations. Being part of this digital world has therefore become a prerequisite for success in all aspects of life (Qassem Al-Nawashi, 2010, p22)

Mastering these technologies is considered one of the successful means in preparing the new generations to shape the present, face the future, and meet the major challenges that it carries.

Perhaps the most important achievement of information technology is the emergence of the computer and its applications, as they have become an integral part of the life of modern societies (Sajana Sigdel. J, 2017, p02) Furthermore, the birth of the Internet from the womb of this technology has brought about floods of information and made it available and accessible to all in matters of minutes or seconds. It has now become an obligation for every society, that wants to catch up with this information age, to educate its generations on the use of computers and its applications and enable them to face the challenges this new era (John Siraj. B, 1999, p158) In this respect, many countries of the world have engaged in various programs of computer literacy are considering computer education as the fourth basic skill of literacy in contemporary society after the three known skills of reading, writing and arithmetic.

Accordingly, the educational and training activities are facing a challenge of a new kind which imposes on those in-charges the necessity to engage a comprehensive review of the foundations and objectives on which the educational system is based. Likewise, education institutions, including kindergartens, have to keep pace with this technological boom by integrating information technologies their programs and activities, in line with what has been confirmed by many studies, including the one by " *Lieberman* " stating 3that "what has not been learned in kindergarten will not be learned at a later stage; because what is lost early cannot be compensated, or compensated in a distorted way"(Al-Qatami Yusef and Thabit Fadwa, 2009, p18) The study carried out by " *Dodson*" , best known for his book entitled " Everything is done before 06 years" , stressing the importance of child education before the age of six (The National Institute for Research in Education, 2011, p31) an early childhood stage corresponding to kindergarten, which is considered a fundamental and foundational stage upon which the subsequent learning and development stages are built, not only because it is the beginning of a long series of critical changes in the life of a child, both quantitatively and qualitatively.

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This aspect has been confirmed by recent scientific researches on the relationship between the early experiences that a child has lived through and his physical, mental, psychological and social development. The early years of a child's life have a great importance in the growth and development of the child's brain - about 80% of mental development takes place at this stage-, whereby one billion neurons of an incomplete nature are born. Although their number is constant and does not change, they are activated whenever exposed to environments that are rich in sensory stimuli, which positively affects the functions and mental abilities, especially those required for learning, such as remembering, attention and comprehension.(The Ministry of Education, 2006, p04)

On the other hand, negative influences, stress and tension will stop the activity of some cells and lead to a deficiency and weakness in the child's various abilities, which will only leads to a lack of academic achievement, but also to difficulties in facing the issues of daily life at the stage of maturity, where offsetting that deficiency will be very difficult and costly.. (The Ministry of Education, 2006, p04)

Numerous studies have indicated that children, starting from the age of three years, can use the computer successfully and deal with it as developmental equipment. At this age, they only lack knowledge and experience but not thinking ability.(Judy Van. S, p114)

A study conducted by " Nancy Zomer " on the effect of using technology on the learning of children aged between 3 and 6 years, analyzing the findings of 30 other scientific studies on the topic, revealed that these studies all agreed by 94% on the positive impact of information technology on various aspects of development and on improvement of childrens' learning process. (Nancy. Z, 2014, p-p42-52)

To confirm this, the study came up with a forward-looking vision on the transformation of education in kindergartens from stereotypical nature to informatics by integrating information technology (computer) within their programs by through presentations and analysis to the computer in kindergartens, computerized programs for children in kindergartens, kindergarten educators and the use of computers Disadvantages and obstacles of using computers in kindergartens.

2. Computer in kindergarten:

The child in the kindergarten stage learns by foresight and observation then moves to the stage of verbal learning. Computer can then play an active and important role in the kindergarten thanks to its ability to develop the child's conceptual system and his level of thinking by practicing attractive activities and educational games, which will, in turn, make him more willing and eager to learn and interact freely with this device by trial and error until he gets very familiar with it. Skills provided by the computers together with a proper guidance and feedback will surely enhance the child's visual ability and visual-verbal synergy, the child's reactions and responses will then come either in the form of verbal, audio, visual, or written message on the screen.

2.1 The importance of computers in kindergarten:

Studies have shown that the computer helps the child to remember and retain information. He can remember (%20) of what he hears and (%40) of what he hears and sees. This percentage increases to about (%70) when he

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hears, sees, works and interacts with what he learns. (Hilal Ahmad Al-Qubati, 2015, p78)

Importance of the computer is summarized hereunder:

- Conducting experiments using a computer can depict objects and topics that were out of children's reach and could not be carried out as experiments in laboratories such as displaying simulations of spaceflight. It also helps them visualize and imagine difficult concepts, provides them with new experiences as well as instilling the child's self-confidence ridding him of any feelings of fear and anxiety that may hinder his ability to learn.

- The use of the computer in kindergartens will help the child to develop coordination between movement and sound, as he usually gets a large part of learning through sensorimotor activities, to acquire self-learning through experimentation, exploration and trial and error, and, as a result, to get the self-confidence and satisfaction from a number of concepts and skills in line with his level of maturity. (Areej Bint Muhammad Abdul Aziz Al-Mansour, 2016, p-p27-28)

- The computer contributes to the development of the children ability to pay attention and focus while practicing activities, such as story-telling, puzzles and quizzes, that are provided by software programs.

- The computer is a positive way to build the child's self-confidence ,as he feels self-satisfied when he goes through mature experiences. It can help shy children to gain self-confidence, overcome their shyness and feel happy by interacting with this technology.

- Achieving principle of individualization of learning is imposed by individual differences among children. Multimedia programs provide the child with multiple alternatives to choose from, in the domain and subject that wants to interact with (Hilal Ahmad Al-Qubati, 2015, p78)

- The computer can interact with children regardless of their economic and social backgrounds and with all generations according to their abilities, regardless of their level of experience or their educational background .It provides all children with equal education opportunities, in accordance with their level and previous experiences. (LIZ. B, 2002, p255)

- It helps children to acquire the concepts of order and sequence, classification and comparison, from which they will get a great deal of problem solving and critical thinking skills. In this regard, "Taylor " is of the opinion that children who learn through computer programs would be able to develop the skills of step-by-step thinking and ways of reasoning and drawing conclusions, even if their learning was through games or entertainment, as computers contribute to the development of thinking by providing answers to all questions of: What? Why ? How ? and when? (Zakaria El-Sherbiny and Yousrya Sadeq, 1998, p105)

It helps children acquire social skills, especially the skill of communicating with others as they usually tend to learn with their peers and not on their own. (Mccarrick. K; Li. The X, 2007,p73)

- Developing children's listening skills through listening to and carrying out instructions, or by listening to and watching animated stories.(Salwa Mortada and others, 2012, p171)

- Developing the ability to innovate through drawing and coloring.

- Use of computer by in the completion of its management.

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- Kindergarten managers and educators must use computers extensively in order to acquire and develop their computer skills. (Muhammad Metwally Qandil and Ramadan Massad Badawi, 2007, p466)

In conclusion, the use computer in kindergartens is of utmost importance because of its effective role in developing the various abilities of children and in helping them to communicate with others. It also provides a service for educators by saving necessary data related to kindergarten management and children's' education.

2.2 Computer Objectives in Kindergarten:

Introduction of computer use in kindergartens implies that it should be in accordance with the prevailing scientific and educational methodology by setting clear goals for its teaching. These are classified into cognitive, skill and emotional goals.

2.2.1 Cognitive goals: tthese are mainly goals with a cognitive dimension for children. (Abd al-Aziz Talibah Abd al-Hamid, 2011, p38).

−To learn how to operate the computer in a correct and safe manner.

−To know about computer parts and understand some technical terms such as: computer, internet, keyboard, mouse, printer, digital camera, etc..

−To learn about the most important keyboard functions.

−To acquire interactive experiences that will contribute to developing thinking skills, curiosity and problem solving.

−To explore and represent information in multiple and effective forms.

To learn the basics of browsing on the Internet, and explore multiple ways of communication

2.2.2 Skills goals: They are mainly represented in goals with a skill dimension for children, which are. (Abd al-Aziz Talibah Abd al-Hamid, 2011, p38)

−To learn how to use and operate the computer in a correct and proper manner.

−To use the mouse by moving the cursor on the computer screen.

−To develop writing skills by typing numbers, letters and words using the keyboard.

−To develop reading skills and gain a good understanding and a wider view of mathematics.

−To increase the ability to achieve, taking into account the diversity of children's learning styles.

−- To allow children to choose and control their speed, and the level of difficulty in handling and processing information.

−To explore information and represent it in multiple and effective forms.

−To become independent and proactive learners.

−To learn to work collaboratively, so as to gain the ability to teach one another new information, and exchange opinions on complex processes in a more practical and effective way.

2.2.3 Affective goals: they are represented mainly by goals that have an emotional dimension for children. (Hana Muhammad Abdel-Rahim, 2009, p18)

−To prepare children for an ever-changing society.

−To ensure fairness in all children's exposure rates to available information.

−To make sure that the children appreciate the importance of the computer and take care of it.

−To ensure that the children execute instructions given to them by the educator when using the computer.

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−To ensure that the children are using the various educational and entertainment programs provided by the computer with pleasure and working in harmony.

−To ensure that the children are less afraid or intimidated by the computer, so they become more confident and socially aware.

2.3 Specifications of the computer corner in kindergarten:

The computer corner is one of the important areas in kindergartens. It must be in a quiet area with the display screens placed in a way that allow the child to see clearly. It must also accommodate a number of devices so that every two children can have at least one device. The area should satisfy all health requirements and be appropriate to accommodate this activity without causing the children any physical harm or obstacles. The computer programs should be selected among those that can help the child in critical thinking, innovation and collaborative work with others. (Salwa Mortada and others, 2012, p173)

for the user group. Low shelves may be provided in remaining space _. (Muhammad Metwally Qandil and Ramadan Massad Badawi, 2007, p486).

There are several factors to be taken into consideration when choosing a computer corner location, they include. (Douglas. H, 2002, p-p160-163)

* **Safety:** the computer desk should be placed against a wall to avoid electrical problems and prevent children from touching the wires.

* *Special Care*: to keep the computer away from harmful substances, such as paints, water, and food.

* ***Lighting:*** to avoid glare or excessive brightness of the computer screen. This should be checked by the educator by looking at the screen from the child's height.

* **Passage areas:** many educators tend to place the computer corner away from the passage corridors, but studies suggest that placing the computer in a more central way in the room, may be more appropriate and allow easy integration of the corner in the classroom.

* ***Noise level:*** allocated computer space should be placed in a far and quiet corner. It may be separated from the rest of the class to isolate its activities from the daily classroom routine. However, many educators suggest placing the computer near the learning corner, to make it easier to link computer activities with other activities.

* **Arrangement of computer accessories and related material:** there are multiple ways of organizing these item. However, the chosen setting should encourage the independence of children in using the computer and allow them easy access to accessories.

2.4 Computer uses in kindergarten:

Computers are used in Kindergarten in three areas, as a means of learning, education and entertainment.

2.4.1 Using the computer as a learning method:

Concepts related to computer science and technology should be part of kindergarten curricula, with the purpose of introducing the children to “computer culture” and somehow raise their level of electronic illiteracy. (Jawdat Ahmad Saadeh and Fayez Adel Al-Sartawi, 2010, p43)

Enthusiasts from the electronic community argue that computers push children to better learning by creating more effective environments that will allow them to experiment with technology and get prepared for the future. Early learning of computer technologies will also help the children make

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a leap towards progress and success. (Atef Mahmoud Abdel-Al and Muhammad Al-Sayed Al-Najjar Muhammad, 2014, p240)

2.4.2 Using a computer as an educational tool:

This use has led to different methods of teaching and acquiring knowledge. The introduction of computers as part teaching tools has meant that educators are now obliged to define the behavioral goals required for the learner, to conduct a careful analysis of the content of the teaching subject and to choose the method that should be adopted for delivering a clear detailed course material.

Therefore, the objective of education would not be limited to what can be obtained from knowledge, but also to creating an element of suspense in the process of transferring it to the learner, so he may come forward to grasp that knowledge in a conducive atmosphere. (Jawdat Ahmad Saadeh and Adel Fayez Al-Sartawi, 2010, p46)

2.4.3 Using the computer as entertainment:

This concept is one of the modern methods developed by educational scholars in the educational field, thanks to progress achieved by contemporary societies in the field of technology and electronic computers, in general, and to availability of various computer programs and electronic games dedicated to children entertainment and leisure (Mustafa Abdul Sami Muhammad and others, 2009, p130)

This technical progress has succeeded in attracting children to computer games which have become easier to play because they do not require prior computer knowledge. Consequently, personal computers have become somewhat easier to use, leading to a rapid spread of this type of games. (Kam. M, 2008, p58) ,Computer games have ultimately become a prime entertainment for children. They make it possible for them to discover, to experiment, to uunderstand, and to practice without any risk, as well as testing their fears of certain things and failure to accomplish other things.

Many studies have also confirmed the positive impact on the development of kindergarten children who play electronic games in a moderate way, this is due to these games positive effects on increasing thinking skills. (www.primotoys.com, p17),. such as understanding, analyzing, synthesising and acquiring various intellectual habits like problem-solving ,flexibility, initiative and imagination, as well as developing eye-to-hand synergetic sensory-motor skills, and stimulating motivation and learning the values of perseverance, winning and accepting loss. (Nahil Al-Jabri, 2009, p09)

In this respect, iinternet has proved to be one of the strongest and most important sources of education. Children can use this network to search for information in both audio and visual forms through browsing network's electronic pages, and even access super media sites that allows them to view pictures and video clip. Children can exchange e-mails and send and receive messages to and from all over the world and in any language, and share data and information in various fields, including participation in educational games directly. (Zakaria El-Sherbiny, 2006, p85)

3. Computerized programs for children in kindergartens:

This chapter deals with the methods of designing computer programs for children and how to classify them according to learning theories and requirements, while highlighting the methods and strategies for

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employing and using children's programs in kindergartens

3.1 Designing computerized programs for children:

Interactive educational software's are designed and produced to meet the educational goals of the kindergarten stage and as a rich and well developed educational tool to put in the hands of educators to support the child's self-learning, that is why curricula designers rely on this technology as basis for the development of education.

Education design constitutes a theoretical framework model for educators to follow and to activate the educational process and its various tasks such as knowledge transfer, skills acquisition, and quality of learning spaces. (Jhon Siraj. B, 2003, p04) The software is run through: (International childhood center, 2014, p06)

−E-learning systems and educational portals conforming to international standards,

−Operating systems on tablets and smart phones,

−CDs for use in kindergarten classes and at home.

Several factors should be taken into account when designing educational programs, including:

−The necessity to positively employ and use technology for early childhood learning according to standards and controls that protect the child and develop his capabilities.

−Reliance on expertise in the field of educational software design.

−To take full advantage of computer features when displaying programs (colors, sound and accurate presentations).

−Slow presentation of skills and sequencing movements with the aim to clarify skill learning.

Capitalize on the expertise of specialists to illustrate and explain the required skills. (Ghassan Yousef Kotait and Samir Abdul Salem Al-Khraisat, 2009, p29)

−Not focusing on whether the answers are right or wrong, but rather on giving the opportunity to find alternatives that can provide solutions.

−Pushing the child to find rare and varied responses.

−To make it easy for the child to handle without constant help from adults.

−The programs should include topics that encourage the skill of receptive conversation (the skill of listening) as well as encouraging expressive conversation (speaking and writing).

−To avail an atmosphere of fun to the child while using it.

- To instil a feeling of success to strengthen the child's self – confidence. (Fatima Jamal Al-Din Mahmoud Ahmed, 2006, p65)

The importance of educational program design lies in the fact that it constitutes a bridge between theoretical sciences (behavioural and cognitive sciences) and applied sciences using technology in the learning process. Nowadays, technology has made a great leap forward to the extent that the gap between educational theories and practices is widening, so there is a great need to design educational programs that ensure transformation of education the theoretical framework based on remembering and memorizing to the practical form in which learners seek to be effective in applying what they have learned into their daily lives..

3.2 Employment of computerized programs for children in kindergartens:

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There are several methods and strategies for employing children's programs in kindergartens, all of which depend on the type of programs directed to children, including educational, cultural and entertainment programs. These strategies and methods are:

3.2.1 Employing children's computerized educational programs:

There are several strategies related to how educational programs for children can be used in Kindergarten, the most important of which are:

* **Educational games strategy:** through which children learn the computerized program indirectly through computerized activities that can achieve fun to some extent. It depends on the child developing and setting up a plan by which he achieves victory in the educational computerized game to achieve certain goals according to some specific rules. Examples of these programs are: Parrot Words and Basic Additions.

Learning through play is consistent with the interactive and visual nature of computer activities, as studies have confirmed that children learn through sequences of play events and feedback provided to them, whether visual or audio. This strategy achieved great success, as children do not dissociate outputs that they achieved through play from those achieved through exploration; they learn through playing and play to learn.

* **Simulation strategy:** Simulation is the process of representing, modeling, or creating a group of situations by acting or imitating real-life situations to explore their secrets. The need for this type of program arises when it is difficult to represent a specific event in reality due to its cost or complexity. (Samah Abdel Fattah Marzouq, 2013, p152) ,this means placing the child in a position similar to real-life situations that he will be facing and taking responsibility for the decisions he makes, or take corrective measures if his decisions happen to be wrong.

The simulation situations are presented through the computerized program in the form of a scenario, static or animated pictures, or tools to conduct an experiment, especially those experiments that are difficult to conduct in real life, and deal with topics such as: space, atom, nucleus as well as magnified vision using the microscope.

* **Training and Exercise Strategy:** this computerized program aims at training children in what the educator is delivering, so that this training is done by providing educational exercises to the child and receiving his responses, then informing him of the correctness or error of the response. After answering all exercise items, the computerized program provides the child with feedback informing him of the number of correct and wrong responses along with the corrections of the wrong responses in order to benefit from reviewing them.

The scientist"Madex "and his colleagues pointed out that the most common type of exercises and training programs includes training in numeracy skills. There are many such programs that teach all kind of things such as math facts, increasing the amount of learned vocabulary, city names, and foreign languages.(Maddux. C. D; Johnson. D. L, 1997, p61)

* **Private teaching strategy:** It requires that the computerized program should explain the educational material and give extensive examples for the purpose of clarification by dividing the content of the educational material into small parts organized in a logical order and followed by questions to evaluate the child's learning. If the child's answer is

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correct, the program moves to the following part, but if the child's answer is incorrect, then the computerized educational program will transfer him to an explanation section and provide him with a detailed information on the topic, the program then returns to the same previous step.

* **Problem-solving strategy:** the purpose of this strategy is teach the child how to think and acquire skills of solving problems. In this respect, the educational program sets up a problem and the child has to solve it by retrieving experiences and applying previously learned concepts or he has to write a program on the computer to solve that problem. The role of the computerized program is to perform adequate and sufficient processing to help the child reach the correct solution to the problem; therefore, helping him to learn how to think and how to use his mental and logical abilities to acquire solving problem skills (Mustafa Abd Al-Sami Muhammad and others, 2009, p347)

3.2.2 Employing children's computerized educational programs:

These programs have proven highly efficient in providing the child with various skills related to the religious aspect, the social aspect, the emotional aspect, and the ability to think. Therefore, they are programs that seek to achieve educational goals and develop skills, including:

- Getting to know positive values, attitudes and habits.
- Knowing the different inventions and human experiences and their issues.
- Being aware of the surrounding environment and the world in which the child lives, and thus he gains self-confidence, develop conversation skills and competition with peers in the implementation of environmental projects.
- Development of positive attitudes among children towards dealing with technology tools and development of correct behaviours. (Mustafa Abd Al-Sami Muhammad and others, 2009, p173)

Among these computerized educational programs for children in general and kindergarten children in particular, we may find:

* **Environmentally oriented programs:** these programs aim to compensate the child's environment cultural deficiency and provide him with the various environment components and life and social experiences he needs, and which require a special preparation commensurate with the preset goals for each of them. These programs work to stimulate the child and attract him to the materials and activities of the environmentally oriented program (Samah Abdel Fattah Marzouq, 2013, p128).

* **Thinking games:** These are the types of games which require the child to perform actions that depend on multiple mental skills, such as: puzzle, observation, memory and chess games. (Mustafa Abd al-Sami Muhammad and others, 2009, p233)

* **Drawing and coloring programs:** These computerized programs that provide the child with tools and spaces for drawing as well plain plates prepared in advance for coloring or with both activities together. The child is allowed to print his drawing and keep it or show it to his family and friends. The " Flip Flop Program" is one example of these kind of programs (Mustafa Abd al-Sami Muhammad and others, 2009, p209)

* **books and e-stories Interactive:** the electronic book contains all kinds of information (facts, concepts and principles...), accompanied by illustrations, pictures, audio comments, and

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sometimes by video clips. It also contains interactive electronic stories accompanied by films and animated images. The child can choose the desired language and control the development of the story events thanks to their interactivity. Some electronic books have the feature of allowing readers to choose the language or listen to the word or phrase that they cannot read when clicking on it, in addition to displaying its interpretation or meaning (Allison. D; Cynthia. S, 1996, p110)

In conclusion, computerized programs for kindergarten children as an educational, cultural and entertainment tools is of utmost importance and imposes itself in this age of informatics and advanced technologies, its use should be commensurate with the child's preparedness and capabilities and in accordance with the society's principles and value.

3.2.3 Employing children's computerized entertainment programs:

These children's programs aim to achieve leisure, entertainment and fun for the child through various electronic games. They come in several forms:

* General entertainment games
* Sports games.
* Imaginary games.
* Realistic violence games.
* Fantasy violence games.
* Architectural constructive games.
* Strategy games.

4. Kindergarten educators and the Use of Computers:

The teacher is a pillar and an effective force in the educational system and an essential entry point to any education reform. He is the starting point of all targeted changes and developments of the educational process, which in turn represents the basic building block for the development of manpower in any society. As such, interest in preparing him and upgrading his skill and professional levels has become the overriding preoccupation of all institutions in any country, especially in this challenging digital age in which educators do not generally have the same competence level in digital skills that the learners themselves possess. (Sarah Grand. C, 2017, p07), Modern kindergartens require that educators and educators have a number of cognitive, skill and emotional competencies that qualify them to do their work successfully.

Universities, training centers and kindergartens are the primary receptacle for academic preparation and professional qualification of kindergarten educators, so it has become a must to set new global standards that cater for the development of their capabilities in line with the contemporary changes and the new roles imposed on them by the presence of computers. Some of the imposed new roles are abilities to create and use educational software and to use a computer for the implementation of educational experiences.

4.1 The kindergarten's use of educational software:

The new role of educators to use educational software can be summarized as follows:

* **Preparation stage:** begins with ensuring the safety of all computers and their accessories, electrical connections, checking all devices, preparing raw materials that children need during work, such as printing paper, printer cartridges, storage CDs, rreviewing the software that to be used In the process of learning and teaching and how it works by reading the instructions and getting to know the uses of some computer

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keys, then feeding the computer with some information necessary to produce types of activity tools such as connecting similar objects, circling, coloring, placing a sign, etc,.. then correcting and announcing the result once the child has completed the test.

*** Operation stage:** the children names are recorded on the computer for the experiment they will undertake, some assessment tests are prepared and some information related to the use of computer keys is provided. Upon completing the assessment tests, information related to each child is registered in a four-column table. The educator will then allocate various programs to computers and direct the child to work on the computers assigned to their respective activities. The educator is then required to follow the children and provide assistance when needed.

*** Post-operation stage:** the educator's work does not end once the children finish their assignment, but he must extract software CDs from computers for safe keeping and make sure to turn off all computers, disconnect electricity, and record notes and observations pertaining the children performances to follow up their progress.

4.2 Creating the educational software by the educator:

Following the emergence of multimedia software, it has become easy for kindergarten educators to use computers as they were no longer required to have wide knowledge of the computer programming. Although kindergarten educators are, until the present time, not involved in Software development and production, it is necessary in the future to train them, just like the other educators of higher grades, in the field of creation and preparation of educational software, taking into account the specificity of the kindergarten children.

4.3 Computer Use by Kindergarten Educators in Implementing Educational Experiences:

This is done through the use of the computer in the kindergarten as a means of learning or entertainment, in addition to its uses in the traditional educational system, which is to record information related to the children through a special program to partially manage the educational process, such as recording the names of children in groups and taking daily notes on the child and his performance in the activities. The computer helps to gives quantitative assessments of each child's level and the extent of development achieved his presence in the kindergarten. The computer can also help the educator to provide monthly and quarterly reports to parents about the progress of their children in kindergarten. (Samah Abdel Fattah Marzouq, 2013, p-p96-98)

Thus ,a kindergarten educator has new roles imposed on him consisting of using technology programs. To play this role effectively and to succeed in performing duties, he must be prepared and trained to creatively use computer so he can be to transfer his computer knowledge to the children.

Also, if computer softwares are well-prepared and made available for the kindergarten, it will ensure that the interaction between the child and the computer will achieve a good and effective learning. However, it is worth noting that computers in the kindergarten are not meant to substitute educators in developing thinking skills among children, but they are rather used as a stimulating environment of the child's imagination under the supervision of the educator.

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5. Disadvantages and Obstacles to Using Computers in Kindergartens:

Despite the positive features of computers ,they are not without negative effects on the children themselves. The experience of integrating computers into kindergartens faced several difficulties and obstacles that had limited their widespread utilization, and which are as follows:

5.1 The disadvantages of using a computer in kindergarten:

Sitting for a long time in front of the computer affects negatively the child's health and nervousness. (John Siraj. B, 2006, p147). which would lead to some negative behavioural aspects, as follows:

- Lack of interaction and lack of realistic friendships with peers.
- Tendency to laziness and lack of sports activity.
- Aggressiveness and excessive hostility.
- Reliance on reading from the computer and neglecting to read from the book.
- Simulating selfish behaviours and increased tension. (Nahil Al-Jabri, 2009, p12)
- Lengthy programs and their large number of steps or items may lead some children to a feeling of boredom and inability to sustain effort.
- Computers do not provide direct opportunities for learning manual skills and practical experimentation.
- To use computers as a reward or as a means to achieve discipline in kindergarten.(Hana Muhammad Abdel-Rahim, 2014, p19)
- User of the computer, while searching for information and browsing the Internet, is exposed to many electronic games, social media, and entertainment activities and he may be distracted by them. (Rafal.W, 2014, p19)

5.2 Obstacles to using computers in kindergarten:

Obstacles to using computers in kindergartens, especially in underdeveloped countries, may be summarized in following:

- Technical tools are not available for all kindergartens, and computer use in education is somehow costly. This is aggravated by the rapid evolution of computer technologies, as kindergartens find it difficult to constantly renew their technical stock or acquire ready programs for all their types of devices. Consequently, many kindergartens find it extremely difficult to allocate and equip a dedicated computer corner.

(Jawdat Ahmad Saadeh and Adel Fayez Al-Sartawi, 2010, p57)

- Lack of suitable high-level computer programs due to the great efforts required to design and write programs. It has been shown that producing a half-hour educational program takes between 70 to 100 hours of work, some kindergartens are tempted to making copies of them without obtaining reproduction rights of their legitimate owners, which raises complex legal, ethical and professional issues.
- Most of the computerized programs are in foreign languages, which is not always appropriate and convenient. (Ahmed Hussein Al-Sagheer, 2005, p.p12.13)
- The scarcity of educational programs in the Arabic language constitutes an obstacle to generalizing computer use in education, the existing ones are found to contain errors.
- Fear of the impact of computers on children's attitudes, as some educators believe that their. (Nada Badr Jarrah and Wafa Sabbar Ashour, 2009, p07) - Due to lack of paper training and practice, many educators do not have the right skill to use computers and its applications in

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the educational process, and thus lack ability to program and transform the curriculum items into information units that can be delivered by a computer.

- Some education boards and people in charge of education system still do not believe in the benefits of using computers in the teaching and learning processes

(Nada. M, 2014, p238)

6. The reality of using information technology (computers) in kindergartens in Algeria:

(Official bulletin, 2008, p.p17.18)

Algeria's experience in preparatory education has come a little later than in other Arab countries from both legal and institutional frameworks governing the sector. However, this experience was present under different cultural and educational forms during the colonial period that continued to exist even after Algeria's independence in 1962, along with some French and non-French establishments which continued their activities for a long period after 1962 under the tutelage of Christian (brotherhood) associations.

This educational legacy of the French occupation was far from being compatible with the Algerian social realities. This has prompted the Algerian education authorities to engage a complete rebuild of the educational system through a set of reforms that went through several stages from 1962 up to 2008, leading to changes of curricula in almost every decade.

Based on a new directive law on education that promulgated in 2008, Algeria hastened to bring about changes to its education system in order to be in line with the third millennium goals and the new world order imposed by globalization and information technology. However ,Algerian kindergartens are still floundering in the chaos of various foreign programs (western and Arab) and not giving due consideration to using modern technologies in the educational process, including computers.

A careful analysis of the obstacles that are preventing the use of the computer in Algerian kindergartens revealed a lack of a real will and absence determination from the State, represented by its institutions in charge of pre-schooling education i.e the Ministry of National Education (supervisory body) and the Ministry of National Solidarity and Family (legally responsible body), to launch and proceed effectively with the revival of this sector.

In theory, the existing laws, ordinances and guidelines pertaining to the Algerian education system are not different from what exists in the rest of the world where modern technologies are efficiently used in education. This aspect is highly stressed in (i) the Platform of Curricula for Preparatory Education issued by the Ministry of Education in 2004, which emphasized the need to include information technologies in scientific activities, and in (ii) the Guidelines of National Education issued in 2008, which stated that: " a modern school geared towards the future, should be fulfill the following.

Adhere to the global movement of progress and integrate changes resulting from the emergence information societies, communication and scientific and technological revolution, that will impact the new conditions of work and educational relationships.

- Oopenness to the world in the form of cultural relations, personnel exchange, with other nation. However, cconstructive interaction with other cultures and knowledge societies requires that the Algerian school

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should provide students with a true scientific and technological education. Accordingly, the scientific and technical dimension of the Algerian school should equally address the shaping of minds as much as procuring knowledge and skills.

- Prepare students to live in a world in which all relevant activities are closely tied to information and communication technologies. These technologies constitute a strategic pillar in the project of the schools of tomorrow, and mastering these technologies is one of the successful means to prepare the new generation to face the future and meet its challenges. It therefore necessary to include them in the learning process since the early years of the academic track to facilitate the process of acquiring knowledge and help develop the learners ability to search, process, and exploit information to find answers and solutions to the problems which they may face.

The Ministry has also set some guiding rules and codes for selecting appropriate pre-school furniture and educational aids, which should include : individual chairs ,individual tables ,shelves , a television set, a VCDA, and a computer with its supplies and accessories for every child (provision the latter is considered almost impossible, especially at the level of classrooms of the public sector).

The said codes stressed the need to create a national curriculum for preparatory education targeting to ensure the development of a minimum basis of competencies for all children (minimum guaranteed knowledge for all), regardless of their pre-school institutions and educational specificities.

In practice, these guiding codes are still yet to be implemented, especially with regards to integration of information technology into the educational process, as pre-school education curricula are often subject to personal initiatives more than to mature and well established programs. However, this does not negate efforts of many institutions that striving to achieve the fundamental goal of the motto: "getting ready for school".

In general, the prevailing pedagogical practices in Algerian kindergartens are a continuation of those being received by the child at home, where the educator is the one doing most of the work instead of the children and repetition of information is used as a means of teaching, similar to parents' role at home.

The number or Kindergartens in Algeria reached 21,155 in the 2017-2018 school year, where 563,438 children were registered, ranging in age from 5 to 6 years, distributed over 213,933 groups supervised by 22,074 teachers, educators and mentors .(Statement of preparatory education during the academic year 2017/2018), Although, no field studies have so far been carried out on the status and realities of kindergartens in Algeria ,in general, and on the use of information technologies, in particular, it is most important to engage comprehensive review of the 2004 Platform of Curricula for the Preparatory Education to align it with the latest developments that have taken place in the global educational environment, particularly in the field of information technologies, bearing in mind that major efforts should be exerted towards preparing a new generation of educators and children.

The revised platform should focus essentially on improving the level of scientific qualifications of educators, supervisors and workers of the sector and on the way they deal and cater for the child's

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natural dispositions at this stage, in order to avoid having an increasing number of ill-prepared children for the next schooling stage because of the pressures that would be caused by educational practices that do not take into consideration all the circumstances surrounding and influencing the educational environment.

7. Suggestions:

The following proposals may be considered in the form of solutions and that are likely to improve the situation of kindergartens in Algeria:

1- It is necessary to integrate information technology (computer) into the educational process, as its use combines both entertainment and learning needed by kindergarten children.

2- To benefit from the experiences of developed countries which have a leading role in regard. However, use of foreign programs and educational materials should be compatible with the values and culture of the society.

3- Establishing connections between kindergartens through the Internet to exchange information and research and encourage the spirit of scientific and cultural competition among children.

4- Defining new and appropriate roles of educators in light of linking the curriculum with computer technology. This requires provision of training to educators who lack computer skills to enhance their knowledge with all that is new and keep them abreast with the latest developments. This will ultimately help them to design multi-media educational programs based on the requirements of the curriculum to achieve the child's development goals in the kindergarten stage.

5- To create smart kindergarten where the educational process can be transformed into a process relying on computer applications and the Internet with an average minimum use of one hour a day and 5 hours a week for each child. There is no doubt that the progress made in developing computer-based applications to improve the educational process and learning in the fields of mathematics, science, foreign languages and others will develop the innovative capabilities that our kindergarten children have been lacking for so long by being stuck in a process based on memorization and recitation.

6- To plan, design and implement various educational programs and subjects that depend on and make use of information technology in the form of CDs or websites and setting standards for their evaluation, assessing their efficiency, and adopting them in accordance with learning theories and technology employment standards.

7- To create virtual kindergartens through an existing internet application involving some education units that comprise a number of technical media through which children and their parents interact with those in charge of kindergarten at the same time and in different places (synchronized learning) or in different times and places (unsynchronized learning) through various means of communication.*

8. Conclusion:

The world is witnessing an unprecedented explosion of knowledge and technological progress in all aspects of life, including education. It has therefore become imperative for educational institutions,

*– This application was popular and successful during the "Covid 19" pandemic. Countries that integrate information technology in kindergartens have used it.

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including kindergartens, to keep pace with this technological boom in order to improve teaching and learning strategies and systems. Many studies confirmed that the computer has become a learning tool that must be available in every kindergarten and that children, starting from the age of three years, possess the capabilities that qualify them to deal with computers and successfully acquire their skills, if appropriate software is prepared and made available to them under good educational supervision.

In this era where technology has made a great progress, the gap between educational theories and learning practices has considerably widened, putting pressure on decision makers to redesign education systems and transform their process form the theoretical framework based entirely on remembering and memorizing to a new one based on applications in which the learners themselves seek how to effectively apply what they have learned in real life. This objective will not be attained unless the computer is included within the educational process to benefit from its effective role in developing children's abilities.

To go along with the above, kindergartens now allocate a computer corner within their premises to use in the educational process as a tool of learning as well as for educational, and recreation al activities in accordance with scientific methodology to achieve a set of knowledge, emotion and skill objectives, taking advantage of the fact that children see the computer as a tool for entertainment and play. In this context, entertainment and learning are combined to teach children basic skills of reading, spelling, numeracy, general knowledge and many others, as the child does not separate the outputs that he achieves through discovery, as he learns from playing and plays to learn.

All this is done according to several methods and strategies in which programs directed to children, including educational, recreational and cultural programs, are employed under the supervision of a qualified educator enjoying a number of cognitive, skill and emotional competencies and has the ability to assume the new roles imposed by the use of technology in kindergarten programs, among which the ability of the educator to (i) use the educational software, (ii) write educational software, and (iii) use a computer for the implementation of educational experiences.

Lastly, it is worth pointing out that although it is extremely important to use the computer in kindergarten, its excessive use may negatively affect the psychosocial growth of the children. It is also worth mentioning that experiences of computer integration in the kindergarten had faced several obstacles, especially in developing countries where it was considered as a civilization imperative and a life necessity imposed by the scientific and technological challenges which these countries are currently facing ,especially the difficulty to prepare educators in sufficient numbers and provide an appropriate educational environment, in which education in kindergarten is transformed from stereotypical nature to informatics by way of setting up well elaborated scientific programs.

It has then become necessary to adopt special strategic visions on how to prepare our children for the future in light of the challenges and problems of the coming age, to avoid being left behind other children in the world.

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