RESEARCH ARTICLE   **OPEN ACCESS**

Integrating ICT in Sudanese Kindergartens In Order To Improve Cognitive Development (Case Study Khartoum, Sudan)

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ABSTRACT

The aims of this study are to integrate the ICT with the preschool education to enhance and improve the Sudanese preschool education, by building an integrated educational model (Computerize Sudanese Curriculum for Preschool Education (CSCPE) which it well helps in modifying the teaching method, which the child can get scientific material in a manner suitable for each one, visual, reading or hearing method to handle the problem of individual differences in Sudan's preschool education. Also, to abolished the gap between families and kindergartens in order to enhance educational, psychological and social services from both parties to provide greater educational opportunities for children.

In this study we used the Design Based Research Methodology, It is an interdisciplinary approach, in which researchers and practitioners try to build pertinent theories of learning through designing, developing, studying and iteratively refining interventions for learning.

The results show that the Experimental group shows general academic achievement better than the Control group. From teachers questionnaire analysis the result showed that the opinion of large percentage of participating teachers they are confirming the hypothesis "The introduction of ICT in kindergartens helps the children to understand new information with low time". From parents questionnaire analysis the result showed that the opinion of large percentage of participating parents they are confirming the hypothesis "The introduction of ICT allows parents to follow up their children better and more reliable, compared to the parents who do not have this ICT facility".

Keywords :— **Sudanese Kindergartens, CSCPE, Children, Preschool teachers, Parents.**

I. INTRODUCTION

ICT has made considerable changes in most of our lives, where it could support communication, collaboration, cognitive development, creativity, socio-dramatic play, and learning to learn.

The integration of (CSCPE) in education helps to develop children and the use of information and communications technology inevitably can enhance children's learning, such as character and numbers learning.

Integration of (CSCPE) in Sudan's preschool education helps to reduce the individual differences between the children in which the proposed education model helps in modifying the teaching method, which the child can get new information in a manner suitable for each child, visual, reading or hearing method.

The introduction of (CSCPE) allows parents to follow up their children better and more reliable, compared to the parents who do not have this ICT facility.

II. PARTICIPANTS

a.   **Preschool Children:**

The participants' children; which they are 50 children in preschool First level from two kindergartens, they were classified into two groups the first one is calls "Experiment Group" which using the CSCPE educational application and the other group is calls "Control Group" which only do the traditional education.

Alawaeel, kindergarten, and smart child kindergarten was chosen as the study site, each one have more than one KG1 class with average 27 children in class.

b.   **Preschool Teachers:**

We used a structured and an unstructured interview with many preschool teachers. Also we designed a questionnaire for teachers, the questionnaire focused on our research questions and hypotheses.

The teachers participating are 10. Four of them specialized on kindergartens and the other from other

specialties. Six of them has Bachelor's degree, and the other had Diploma.

c.   Parents:

The parents (mothers) participating our study are 34, we designed a questionnaire for them, the questionnaire take parents opinion on using ICT in their children's education and in follow their children's progress/delay.

III.   THE EXPERIMENTAL STEPS

Firstly, train Kindergarten teachers as a group to use the (CSCPE) educational application.

Secondly, make a pre test for both KG1 class of each kindergarten and storage the children answers on the special forms to compare between those two groups.

Thirdly, apply the (CSCPE) educational application on one KG1 class which is calls "Experiment Group" and traditional education on the other class which is calls "Control Group" for each branch.

Finally, after one month makes a post test then analysis and compare the children answer.
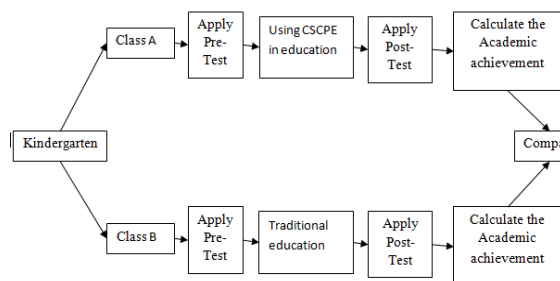

Fig 1: The study Framework

IV.   DATA COLLECTION

The data collected from multiple sources, mostly through participatory observations, interviews with responsible teachers, teachers and parent's questionnaire, in additional to the pre and post test data.

V. DESIGN

Computerize Sudanese Curriculum for Preschool Education (CSCPE) which is a educational application designed by Visual Basic which it helps in children's learning and coverage all KG1 National Curriculum.

The first form displays the KG1's main units as buttons, the tool tips helps teacher to remember the buttons mission.
My kindergarten unit contains of three sub units which they are (My teacher and my friends, kindergarten garden and courtyard, and the class).
Each sub unit contains many experiences (Religious experiences, Language experiences, Experience in Mathematics, Scientific expertise, Social experiences, Technical expertise and Kinetic experiences).
For example, religious and language experiences contain of many topics ("albasmalah", "Greeting", "Sorah–alfatiha", "God created all creatures", "Use the word of courtesy").
The first topic is "albasmalah" or saying "By name of Allah" we have a sound file to spelling it, also we have a video file contains of story about "albasmalah" learning.
The sound and video files play when click on the button.
Other example, experience in mathematics, contains of three topics ("Number one", "Larger and smaller concept", "Classification of class tools").
We have a many image for "number one" and "larger and smaller concept" displaying by image viewer inside the application.

VI.   PRE-TEST   AND   POST-TEST DATA ANALYSIS

Children participating are 50, 25 of them learned with traditional way which is called "Control Group" and the other of them learned with the proposed program which is called "Experiment Group".
In order to compare each child's progress, we executed a test for the children evolving in our experiment, before after using the Computerize Sudanese Curriculum for Preschool Education application (CSCPE). We calculate the difference between each child's degrees witch it represent the academic achievement (Difference = Post test degree – Pre test degree).

Table 1: The pre, post test degrees and the difference

ID	Group	Pre Test	Post Test	Difference
1	Experimental	8	18	10
2	Experimental	16	21	5
3	Experimental	14	22	8
4	Experimental	18	26	8
5	Experimental	12	23	11
6	Experimental	13	19	6
7	Experimental	14	24	10
8	Experimental	22	27	5
9	Experimental	14	22	8
10	Experimental	5	18	13
11	Experimental	13	19	6
12	Experimental	19	22	3
13	Experimental	18	21	3

14	Experimental	21	25	4
15	Experimental	19	22	3
16	Experimental	19	25	6
17	Experimental	13	27	14
18	Experimental	21	27	6
19	Experimental	14	27	13
20	Experimental	23	27	4
21	Experimental	21	24	3
22	Experimental	21	25	4
23	Experimental	16	17	1
24	Experimental	10	27	17
25	Experimental	12	15	3
26	Control	17	24	7
27	Control	19	27	8
28	Control	15	18	3
29	Control	16	24	8
30	Control	8	23	15
31	Control	17	26	9
32	Control	16	25	9
33	Control	17	25	8
34	Control	24	27	3
35	Control	17	24	7
36	Control	11	18	7
37	Control	13	20	7
38	Control	10	15	5
39	Control	16	25	9
40	Control	11	26	15
41	Control	13	23	10
42	Control	19	26	7
43	Control	23	27	4
I44	Control	9	18	9
45	Control	11	13	2
46	Control	19	23	4
47	Control	17	19	2
48	Control	12	15	3
49	Control	13	18	5
50	Control	11	16	5

Using CSCPE => average Learning Effect (Post-test - Pre-test) = 6.96

Using Traditional Education => average Learning Effect (Post-test - Pre-test) = 6.84
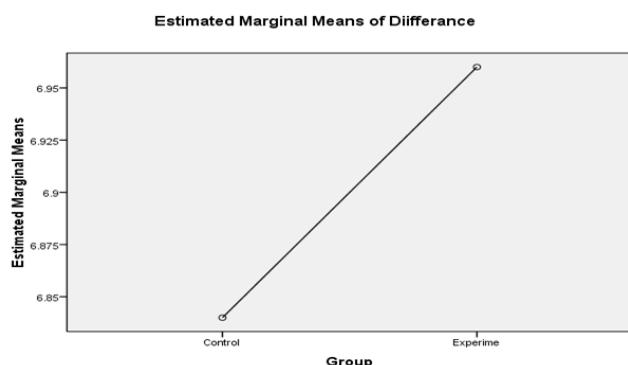

Fig 2: Estimated Marginal Means of Differences

Group

Table 4: Dependent Variable:Diifferance

			95% Confidence Interval	
Group	Mean	Std. Error	Lower Bound	Upper Bound
ontrol	840	62	308	372
xperim	960	62	428	492

VII. TEACHER QUESTIONNAIRE DISCUSSION

We used a structured and an unstructured interview. Also we designed a questionnaire for parents and teachers. The questionnaire focused on our research questions and hypotheses and we analyzed these questionnaires using SPSS 16 to validate our work.

The teachers participating are 10. 40% of them specialized on kindergartens and 60% from other specialties. 60% of them has Bachelor's degree, 40 % of them had Diploma.

20% of teachers sometimes had a problem with their inability to communicate information to all children in the classroom in traditional education.

If the involved teachers notice that a child or some children have not understood 70% of these teachers re-explain again in another way and 30% of them skip it temporarily and re-explain to the rest of the students when they have the opportunity.

70% of teacher seen additional teaching aids to facilitate the delivery of information to children during their work.

50% of teachers take a lot of time to deliver some information because there are no aids.

90% of teachers seen that the computerized curriculum provides adequate teaching aids for communicating information to children.

90% of teachers seen that the computerized curriculum helps to communicate information to a large number of children at the same time.

90% % of teachers seen that the computerized curriculum is an attractive tool for children in the classroom.

80% of teachers seen that using the computerized curriculum helps in communicating information to children faster than the traditional method.

90% of teachers seen that using the computerized curriculum helps to develop the level of understanding of children.

60% of teachers had a desire to use the computerized curriculum in teaching children.

90% of teachers seen that it is easy to prepare the daily and annual plan using the computerized method.

70% of teachers seen that the children are busy reviewing the program rather than making use of the information contained in it.

80% of teachers seen that the parents participation in the contents of the computerized curriculum achieves mutual cooperation between home and kindergarten.

90% of teachers preferred teaching children using the computer curriculum rather than the traditional method.

The opinion of 90% of teachers, it is useful for the kindergarten to use the applications and tools of technology in the classroom.

90% of teachers seen that the use of technology applications and tools in the classroom may contribute to the educational process and keep pace with the technical era.

All participating teachers see that the use of technology applications and tools in the classroom helps to increase the children's language and helps in their understanding of numbers and counting. Also they seen that the use of technology applications and tools in the classroom contributes to increasing the ability of children to analyze and make decisions.

VIII. PARENTS QUESTIONNAIRE DISCUSSION

The parents (mothers) participating in the questionnaire are 34, the questionnaire take parents opinion on using ICT in their children's education and in follow their children's progress/delay. Which 88.2% of them their children using an electronic device at home most of these children using mobile phone and 38.2% of them owned this phone, 85.3%of them spent between 1 to 3 hours per day on an electronic device, 44.1% of them tend to use language educational application, 26.5% of them tend to use entertainment application, 14.7%of them tend to use YouTube, and 11.5%of them tend to use mathematical educational application.

85.3%Of the participating parents see that the difference between the home and the kindergarten in the education and guidance of child may occur because of a different view or appreciation, 61.8% of these parents see some differences between the home and the kindergarten in the education and guidance of their children and these difference in guidance may lead to their children confusion.

91.2% of the participating parents see that sharing instructional information and guidance enables to avoid differences in guidance.

79.4% of participating parents see that the computerized curriculum better explained the nature of the material that their children receive in kindergarten.

88.2% of etc participating parents see that the participation of the computerized curriculum enables to follow up on what their children learn in the kindergarten easily.

67.6% of etc participating parents see that teaching their children using the computer curriculum is more useful to their children than traditional way.

79.4% of participating parents think that using the computerized curriculum in the classroom helps develop some of their children's skills.

69.4% of participating parents think that the computerized approach is an attractive way to teach their children because it contains images with different colors and video with moves.

35.3% of participating parents think their children will be preoccupied with introducing the program rather than taking advantage of the information contained in it when using it in class.

29.4% of participating parents seen that better teach their children in the traditional way than using the computer curriculum.

79.7% of participating parents see that it is useful for the kindergarten to use the applications and tools of technology in the classroom.

79.4% of participating parents seen that the use of technology applications and tools in the classroom may contribute to the educational process and keep pace with the technical era.

IX. CONCLUSION

The results show that the Experimental group shows general academic achievement better than the Control group and that is confirming the hypothesis "Using Information and Communication Technology (ICT) in Sudanese kindergartens increase general academic achievement".

From teachers questionnaire analysis the result showed that the opinion of large percentage of participating teachers they are confirming the hypothesis "The introduction of ICT in kindergartens helps the children to understand new information with low time".

From parents questionnaire analysis the result showed that the opinion of large percentage of participating parents they are confirming the hypothesis "The introduction of ICT allows parents to follow up their children better and more reliable, compared to the parents who do not have this ICT facility".

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