

INTEGRATING COMPUTERS INTO YOUNG LEARNERS' CLASSROOM: THE PATHS TO ACTIVE LEARNING

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Abstract

This article explored the need to integrate computer into the classrooms of young learners beginning from about four years. The idea is that about this age, they are developmentally ready and computer technology can be used as one of many options for learning. Some advantages and challenges of using this medium in teaching were discussed. The paper argued in favour of integrating computer into school programmes as early as possible so as to help them acquire skills for tomorrow's workforce in an increasing hi-tech world.

Introduction

Education for young children is more explicitly designed to provide early development and learning in physical and motor development; social and emotional development; intellectual learning; language development and cognition and general knowledge. The quality and nature of education for these children depend to a large extent on what society holds as the purpose of childhood education. In most advanced countries, take America for instance, their objectives for childhood education centres on giving the American child a good "head-start" making him independent and self-reliant. It is in line with this that, besides the normal education programme for young children, they have in more recent times integrated computer technology into classrooms. In the days of President Bill Clinton, he campaigned for "a bridge to the twenty-first century... where computers are as much a part of the classroom as blackboards". Clinton's vision of computerized classrooms arose partly out of the findings of the presidential task force on the need to push computers into the schools. Reports of the task force cited numerous studies that have apparently proved that computers enhance student achievement significantly. In other studies, Calkins (1983) it was reported that computers had improved performance in "a wide range of subjects, including language arts, maths, social studies and science". Another report found improved organisation and focus in student's writing. Yet another cited twice the normal gains in mathematical skills. On the whole, most schools boasted of remarkably improved attendance.

The seeming conclusion from all of the above is that in a contemporary technological age, only computer-interacted individuals can perform. The call is that computer literacy be taught as early as possible; otherwise students will be left behind. Thus, to make tomorrow's workforce competitive in an increasingly hi-tech world, learning computer skills must be a priority. The question now is, at what age, is the child ready to use computer or appreciate information technology? Enthusiasm for computer activities is not universally shared by specialists in childhood development. The greatest concern is for the very young. Such specialists who are opposed to very access to computers are of the view that exposure to computers will not give children the opportunity to manipulate physical objects such as coloured blocks, sticks, abacus etc. The value of hands on learning, most child-development experts believe, is that it makes an impression in the minds of the child; that it imprints knowledge into a young child's brain, by transmitting the lessons of experience through a variety of sensory pathways. As Healy (1990) explains, "visual stimulation is probably not the main access route to nonverbal reasoning. Body movements, the ability to touch, feel, manipulate, and build sensory awareness of relationships in the physical world, are its main foundations".

Indeed, young children, as they grow have crucial tasks to accomplish. Such tasks help to provide a solid base for further learning. In other words, there are some learning experiences, especially for very young children (under three years) which keep the children in contact with the real world. Such learning cannot come from computers but from three dimensional object learning. The kind of learning early childhood educators like Froebel calls learning with 'gifts' and 'occupation', or the Pestalozzian object learning and the Montessorian didactic learning. Significantly, learning from the above ought to be the premier stage. The child must first have experiences and interactions with other children and adults in the real world, and with objects he can manipulate. Thereafter, at about

age three he is developed enough to better understand who controls the computer and who causes the actions on the screen. In effect, there are rich experiences for a good head start in education that computers cannot provide, liven then, there is the argument in some quarters that computer technology e.g. computer games expand children's imaginations which makes them develop hypertext minds. Children really get excited when they have to work with a computer; and just because it is on a monitor, they tend to be more attentive. It is like there is this magic on the screen.

From the foregoing, it has been established that in the early years from birth till about eight years, as children grow, they learn rapidly, too. Every learning environment is a new experience for the young learner. In other words, every experience and its environment open opportunities which subsequently increase the child's understanding of the world. Following this trend, one would notice a connection which has its close affinity with learning, and how the child's everyday experiences-Fit into his life. This same kind of connection we also find, in the use of technology as a learning tool. When analysed, and in its strictest sense, computer does not cause learning. Instead, it is the connection the child has with other children and adults, as well as the connection of the technology to the curriculum mat altogether provide a basis for learning.

In the light of the above therefore, one can make an argument for 'catching them young', using computer technology as a teaching tool. Whereas information technology may not single handedly and most, effectively bring about all the needed experiences for young learners, if used appropriately, it can be a positive factor in a child's learning process. To attain this, however the following quest! ins need be addressed.

- How developmentally appropriate is the computer to young learners?
- Is the intent of the use of computer technology to replace all or some other meaningful learning activities?
Can computers be substitutes for teachers?

Answers to the above questions will guide childhood educators on integrating computer into the classrooms of young learners.

What is Information Technology?

Technology in most homes today is no longer a far- fetched fantasy. In the last twenty years in Nigeria, various communications and information technologies have found places in our homes. If a child of about seven to ten years is asked to describe his home, he would likely tell you of such equipment as television, telephone, an intercom, sometimes answering machines, fax machines, radio, satellite dish, audio tapes, video tapes and VCR, audio CD and VCD, even electrical games including video games. He would even know how to operate some of these and use them more often than his parents. A closer inquiry would reveal that he has been manipulating these technologies from age three or younger. Going further, one would even discover that about 40% of today's Nigerian children may not all have computers in their homes, but can describe it and even try their tiny hands on it.

In more advanced countries today, technology as conduits to new knowledge, resources and higher order thinking skills have been introduced to classroom teaching. In such countries, computers are readily available for instruction. For young learners (ages three to four) which is our focus in this paper one would say information technology is gradually replacing teaching with VCRS, film strip and instructional television programmes like the popular 'Sesame Street'. In other words, computer for young learners may be continuing the Sesame Street way, but with hi-tech. One is not dismissing the fact that instructional messages are not adequately transmitted via television, neither is one saying that technology can solve 'all' the problems of education. Significantly though, technology is a step beyond television that could help sustain education, especially in a technological age. As Stoll, (1997) explains, "Sesame Street has been around for twenty years. Indeed, its idea of making learning relevant to all was as widely promoted in the seventies as the internet is today". This kind of argument is favoured by computer enthusiasts who believe that the computers'

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“interactivity” and multimedia feature makes the machine far superior to television. This nonetheless, Stoll is yet of the view that there is a parallel between the goals of “Sesame Street” and those of children computing. In his argument. “. . . both are persuasive, expensive and encourage children to sit still. Both display animated cartoons, gaudy numbers and weird, random noises... Both give the sensation that by merely

watching a screen, you can acquire information without work and without discipline". Finally, for critics of information technology, their idea of the purpose of the school is to teach, using more importantly three dimensional objects. Their argument is centred on teach gardening or carpentry, not shovel or hammer? The message here is that the job of teachers and education (as a whole) is to teach the whys and ways of the world. Tools (like television, computer etc) come and go. Thus, teaching our children tools limits their knowledge to those tools, by so doing could limit their futures.

These arguments notwithstanding, hi-tech in today's classrooms and information technology seem to be gradually finding its place in education; more importantly, with hopes of making high quality education available to all. Thus, with increased technology, computers have become quite appreciable in teaching young learners, too. Computer is also used for the same traditional introduction such as presenting information, basic skills, and practical word processing, generally, developing computer literacy. As rightly expressed by Wright (1994) "Today, technology plays a significant role in all aspects of American life. The potential benefit of technology for young children's learning and development is well documented". In other words, computer as learning tools, even at that age is encouraged. Unlike educational television shows where the child is just watching, with the computer he has the mouse in his hand, so participates as an adventurer and an avid learner. This kind of new 'status' takes him beyond the traditional walls of the house.

Essentially, it is often said that creativity begins when children are allowed to pursue those things that have captured their imagination". Story, drawing and scribbling through writing process, is a means that is widely used to foster creativity and inspiration in children Stoddard (1993). Teachers can encourage this development through the use of computers. Goldstein (1998) also shares this view. For him, learning with computers, especially at the early stages can be quite exciting and imaginative, which is more important than knowledge itself. He goes further to say "technology has proven to be an excellent tool in education. By offering a highly structured, multi-sensory environment, teachers are finding that many students with learning difficulties discover it is easier to focus on and assimilate information using technology".

So far, the argument has been that the place of information technology in education need be appreciated. While one is quite in favour of the three dimensional object learning, especially at the very early stages, before three years; thereafter, this young mind can be gradually exposed to learning with computers. Significantly, learning with computers makes the classroom approach to teaching, "project-oriented learning". This is typical of modern day child-centred educators. It is an increasingly popular teaching method where students learn by doing, and teacher act as facilitators or partners rather than as actors. In this instance, computers help children learn to explore and represent information dynamically and creatively, communicate effectively about complex processes. They become independent learners, self-starters, and become more socially aware and confident. For example kindergartners can with computer literacy easily visualize "A" for 'apple' actively participate in it, thereby making easier, teaching concept with concreteness

Child Development and Early Connection, How Appropriate?

Early connection provides resources and information on the approach and effective use of technology with young children. However in matters of this nature, one must firstly begin by making a critical analysis on learning as experiences and how such experiences fit and connect with the child's life. In other words, having established that early connection could provide a basic understanding of young children's learning development, then, we can proceed to ascertaining how and when technology best fits into the learning of the child. Specifically, how appropriate is technology to the child's development.

In the early learning stages of the child, five significant developmental domains have been identified. These include the motor development which centres on physical well being, social and emotional development, approaches toward learning, language development and cognition, and general knowledge. An analysis of these developmental domains would reveal as follows:

In motor development, young learners of about three to eight years having come a long way since birth would have both their gross and fine motor skills become increasingly fine tuned. At age three, they would have mastered a variety of motors skills like jumping, skipping, running, and drawing circles and square with crayon. By the time they are four or five years such skills would have become more refined, having now gained increased control over their muscles. They can now perform

some skills with a bit of accuracy. For instance, they can painstakingly copy letters of the alphabets and draw persons that look real. At age five, children are able to hold and manipulate a thin pencil properly. Typing at a computer keyboard, writing in cursive with pen or pencil and drawing pictures are some of the accomplishments that occur during ages six to eight. Significantly, for young learners to be considered ready for school, and perform accordingly, optimal motor development is quite essential.

In social and emotional development the child's level of interaction and prosocial behaviour is quite crucial to childhood education and general school experiences. When children of this age interact with at an appreciable level, quite appropriate to their development, there is this sense of wellbeing that enables him participate positively in class and amongst his peers. Learning for children also depends to a great extent on the various styles employed by the teacher or adult. For instance, curiosity, creativity, independence, cooperation and persistence are some of the approaches that can enhance early learning development.

Another area which is quite crucial to learning development is language. Language empowers young learners to participate in both, the cognitive and affective areas of learning. At the early stages of learning, the child develops rapidly through prelinguistic communication. He uses single words to stand for whole ideas communicated. By the time this young learner is about six to eight years of age, his language skills, would have improved further. He can hold his linguistic capabilities with that of adults, both in comprehension and in the production of language.

Importantly, language develops the child in self control and in the growth of an understanding in his own use of language. He expresses the self in written and oral language. Language becomes that communicative tool that enables him to represent his thoughts, feelings and experiences even in the adult world.

Finally, children need to be developed cognitively, too, they need that exposure so as to effectively interact with people and concrete objects. Such experience in learning settings and with adult interaction develops them to construct knowledge of patterns and relations, cause and effect, and ways of solving problems in everyday life. Having identified the various domains of child development how do we relate it to 'early connection'?

'Early connection' in this context is providing young learners information on the appropriate and most effective use of technology. Again, the word, technology refers primarily to computer technology. When this concept is further extended it includes such related technologies as telecommunications and multimedia, which are fast becoming integrated with computer technology. Having identified what technology is and who our learners are, and their development capacity, it becomes imperative to focus now and on how and when technology can fit most appropriately into their learning programme. Generally it is often acceptable that children (of about ages three to eight) could learn most effectively through play. The reason being that most part of learning is attained through social interaction with adults and other children. It is also important to note that at this age, the mind of the child is quite impressionable and very curious. Thus, learning here tends to reflect a recurring cycle which begins in awareness into exploration, inquiry and finally, he utilizes knowledge acquired. This early zeal and eagerness to know tends to motivate learning. Can computer technology sustain such interest? Can computer effectively teach or is it just another glamorous tool?

Integrating Computer in Childhood Curriculum: the Paths to Active Learning in a Technological Age

Looking at today's 21st century classroom, we find that digital technologies have expanded and improved the efficiency of education to a large extent. This reform in tomorrow's schools stems from the astonishing power of computerised teaching. Computers in some quarters are described as the ideal teacher that unlike their human colleagues, the computer is never too harried to answer the very many questions of the learner. Also, maybe because computers are not humans they could be quite accommodating and not too distracted to notice the puzzled student. Computer works at the child's pace presenting all the needed information in a variety of ways until children show they understand the material presented. In effect therefore, one say that the best computerized tutor can successfully capture and sustain a child's attention for hours. It is oftentimes argued, too, that computers can free educators by exposing teachers to much more sophisticated, effective and rewarding styles of teaching. The expectation is that teachers of the 21st century who grow up with

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PCs will make better facilitators, monitors and catalysts rather than stereotyped lecturers and taskmasters. Generally, optimists of information technology have much hope on computers as one that can determine each pupil's needs, so as to enable teachers meet their students at their own levels. In the summation of Stoll, (1996), new technologies take away some of the "pains" involved in learning. Also, towing the same line Withrow, (1999) subscribes to teaching and learning with computer but believes that successful approaches vary from hands-on experiments with actual objects to text-based messages depending on the sophistication of the learner. He gives an example thus: "the description of a worm to a preschooler may require a trip to the garden to dig up a worm. But by early school age, a good picture of the worm on the computer screen can help the child immediately match words with concrete objects. He recommends therefore for younger learners mixed-media technologies or multi-media programmes. For Postman (1994) even when he believes in innovations and in hi-tech for that matter, as contributory to new knowledge, he is yet of the opinion that as we gain something, so we may lose. He shares Dingman's (199) views, that computers before they have a broad foundation in reading from books, they will be cheated out of opportunities to develop imagination" the resultant effect he argues will be like stuffing children's minds with "canned" images instead of stimulating youngsters to create their own.

Yet in favour of limiting hi-tech (especially at the early stages) amongst young learners, Oppenheimer (1999) believes that computer is more of a glamorous tool which minimizes the real or physical world in favour of an unreal "virtual" world. His argument centres on the fact teaching children what is on a two-dimensional screen is far less important than playing with real objects, interacting with peers, teachers or parents in conversation. He argues that down playing the importance of conversation, expressing oneself in person with acuity and individuality could also limit the development of children's imagination.

Tailoring Computer Usage to Young Learners

From the argument so far, it seems quite obvious that in this contemporary age, there is need for innovation, and that is why information technology is a welcomed idea amongst nations. However, in the educational sector there are some conflicting views about telecommunications and technology especially in its usage for younger children. Clement (1994) has stated, that there are quite some considerable research on the positive effects of technology on children's learning and development, but the research also points out that in practice, computers supplement do not replace highly valued early childhood activities and materials like arts, blocks, sand, water, books, exploration with writing materials and dramatic play. Even then, Shade and Watson (1990) uphold the view that computers can be used in developmental[^] appropriate ways, beneficial to children at this same time caution that like any other tool, computers can be misused. The appeal therefore is the use of developmental[^] appropriate computer software which offers opportunities for collaborative play, learning and creation. In doing this also, there is need for professional judgement in evaluating and using this learning tool, (computer) appropriately.

Significantly, therefore, it is suggested that the same criteria applied to any other learning tool or experiences should be applicable in computer usage. In effect, there is need for a balance between other learning materials and programmes with that of information technology. It was on this score that the following is suggested as criteria for specific usage of information technology amongst young learners:

- (i.) Oftentimes it is emphasised that the choice of book and other learning materials should tally with the age, individual and in relation to the culture of the children. So also, in the usage of technology and selection of software teachers must ensure that it is age appropriate, individual appropriate and culturally appropriate.
- (ii.) Essentially when computer software is appropriate children's cognitive and social abilities are developed. As Haugland, (1990) points out, developmentally appropriate software engages children in creative play, mastery learning, problem solving and conversation. They repeat a process or activity and experiment with variations. They can also collaborate in decision making, share discoveries and creations".
- (iii.) Technology can be best employed when integrated into a regular childhood educational programme as one of the many options to support children's learning. In other words, the

curriculum content can be enriched if computer practice is functional, physical as well as philosophical.

- (iv.) Childhood educators should take cognisance of the fact that an important tool like technology should be made equitable and accessible to all. As revealed by Sutton (1991), a decade of research on the educational use of computers maintains and exaggerates inequalities. Sutton further adds that gender, race and social class inequalities are rampant in computer exposure and usage. It is therefore suggested that consideration of equity in childhood curriculum content be given qualitative judgement. Also if computer access to all must be meaningful it must move beyond rote drill and practice usage.
- (\.) In the selection of software, class teachers and educators should ensure that such software is a good coverage of the diverse culture, language and ethnicity of the children. In other words, technology can be used to affirm children's diversity and promote positive social values. For instance, it is obvious that violence in software is quite negative to children's development, it is therefore suggested that childhood educators should strongly reject it and keep it out of children's educational programmes. NAEYC position on violence in the lives of children, (1994).
- (\ i.) There is need for parents and teachers to work closely in the appropriate use of technology for all children.
- (vn.) Finally, in order to be active users of technology and better teachers in its usage, teachers need in-depth training. Schools, organisations and communities and individuals should provide opportunities for both pre-service and in-service training. By so doing, teachers will be exposed to basic information and awareness for better staff development and experience. A¹; Bredekamp and Roscgrant, (1994:01) sum it, "technology is an area of the curriculum, as well as a tool for learning, in which teachers must demonstrate their own capacity for learning".

Conclusion

For now, the need to integrate computer technology into our childhood programmes especially in some developing countries is still not quite appreciated. Hopefully however, there are some that can afford personal computers for their wards and children, and even hire teachers to teach them. Evidently, there are yet individuals, parents and even schools who see the need to 'catch them young'. Without gainsaying, we are in a technological world where most things are computerised. Thus, as information technology continues to change our lives, educators have been challenged to utilize its tools rapidly and expand the spread of education as the world of business has done. This can begin while the children are still young, (beginning from about age four). Even though a few sceptics have dismissed this novel idea, rigid on the view that classroom teachers would soon be displaced by electronic gadgets. At least so they thought when radio, television, VCR and other instructional learning tool came along. But that was not the case; instead it enhanced teaching and promoted learning. Again, the feeling in some quarters that computers replace highly valued childhood activities and materials has been addressed in this article. Significantly, it was noted that computers supplement learning, not replace it. That is why the suggestion here is to use technology to integrate childhood curriculum across subject matter areas. The idea is to enrich the curriculum content by using appropriate technology as one of many options to support children's learning.

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