LOGO USAGE AND THE PERCEPTIONS OF PRIMARY SCHOOL TEACHERS IN OYO STATE, NIGERIA

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ABSTRACT

Previous studies have reported that Information Communication Technology (ICT) is an effective and efficient means for widening educational opportunities. However, most teachers neither use technology as an instructional delivery tool nor integrate technology into their curriculum adoption. This could be due, amongst others, to the fact that there are no instructional guides that could train teachers as well as guide integration of technology tools into particular areas of the curriculum. This study, therefore, examines the view of 24 computer teachers’ perception in using LOGO software from different schools in Ibadan North Local Government of Oyo State, Nigeria on the introduction of LOGO programming language into the existing computer studies curriculum for primary school pupils in Nigeria to support and enhance learning. Results showed that the participating teachers were of the view that LOGO programming language should be incorporated into computer studies curriculum for primary schools as soon as possible owing to their perception of its utility and educational benefits. Suggestions were given on how to make this realistic in Nigerian primary schools despite the challenges.

Keywords: Teachers’ Perception, Information and Communication Technologies; LOGO Programming Language

1. Introduction

Governments and educational systems around the world recognize the need for students to be skilled, creative and confident users of a wide range of information and communication technologies (ICT) (Voogt, 2002; Lim, Hung, Wong & Hu, 2004). This led to introduction of ICT’s into schools via different courses of action. ICT is a necessity for improving quality teaching and learning as it creates a powerful learning environment and that transforms learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way (OECD, 2001; Volman & van Eck, 2001). ICT is not just a tool for replacing existing teaching methods but rather, it is an important instrument to support new ways of teaching and learning to develop student’s skills for cooperation, communication, problem solving and lifelong learning (Voogt, 2003).

Integrating technology into curricula with the intent of positively influencing teaching and learning has evolved over the past 20 years (Dockstader, 1999; Dias & Atkinson, 2001). This evolution was driven primarily by hardware and software revolution, accessibility to computers in educational settings, and popular instructional technology trends. Technology integration covers wide range of instructions on programming skills, self-directed drill and practice, interactive learning software, online training, testing, instructional delivery augmentation, and Internet-based accessibility to information, communication, and publication (Dias & Atkinson, 2001).
In Nigeria, the Federal Government recognised the importance of computer education and is emphasizing the need for the integration of ICT into its educational system. This dates back to the National Policy on Computer Education (FME, 1988) which emphasized the need for primary school pupils to be provided with basic computer skills. The objectives of the basic computer education curriculum are to: acquire basic computer skills such as the use of the keyboard, mouse and operating systems; using computer to facilitate learning electronically and developing reasonable level of competence in ICT applications that will engender entrepreneurial skills (NERDC, 2007).

The impact of ICT is one of the most critical issues in education (Webber, 2003). ICT play various roles in teaching and learning processes, according to the Committee on Developments in the Science of Learning (2000). Several groups have reviewed the literature on technology and learning and concluded that it has great potential to enhance student achievement and teacher learning. Furthermore, research has shown that the effectiveness in the use of ICT to support learning is a function of the curriculum content and the instructional strategy such that when appropriate content is addressed using appropriate approach students and teachers will benefit (Cradler and Bridgforth, 2002). The adoption and use of ICTs in education institutions in developing countries remains very limited despite a decade of large investment in information and communication technologies (Trucano, 2005).

The perceived usefulness and ease of use influences the perception of the users while the perceptions predict attitudes toward the technology adoption (Van-Akkeren & Cavaye, 1999). The attitude develops the intentions to use and the intentions cause actual system usage. The beliefs, attitude and intention to use come in place when a user is presented with a new technology. These influence the users “decision” regarding how and when they will use it (Davis, Foxall & Pallister, 2002). Primary schools and institutions in most developing countries are increasingly facing the difficulty of managing and using the multiplicity of new ICTs, such as e-mail, voice mail, worldwide web, cell phones, and videoconferencing among others (Westrup, Liu, El-Sayed, & Al Jaghoub, 2003). In addition, the sheer speed and ease of use of modern ICTs only serves to amplify these challenges. Literature which explores how ICT can enhance the learning environment in early childhood education suggests that the value ICT can add to young children’s learning environments depends on the choices teachers make about which tools to select, and when and how to use these; and their understandings about how these tools can support children’s learning, development, and play (Rachel, 2004). To make these choices, teachers need to be familiar with various tools and what they can do. They also need to be familiar with contemporary theories about learning and development, and recognise how these can be linked to the use of ICT.

According to Yelland, Grieshaber and Stokes (2000) literature suggests that there is likely to be greater integration of ICT in teaching and learning, provided teachers understand and know how to use ICT to enhance the learning curriculum, and communicate ideas and information in new ways using technology. In order to provide such learning opportunities for teachers-in-training, Yelland et al. (2000) suggests that teacher educators need to be aware of variety of ways that ICT can complement and extend teaching and learning contexts in new and dynamic ways, rather than be used to perpetuate existing pedagogical strategies that need to be re-conceptualised. Of all the applications of ICT to education, none generated as much excitement as computer programming, especially Language of Graphics Orientation (LOGO) (Clement, 1985). LOGO is a computer programming language developed for children by Dr. Seymour Papert (1993) to explore ways in which LOGO computer programming can be used in developmentally appropriate ways with young children. The National Association for the Education of Young Children (NAEYC), defined developmentally appropriate practice as (a) age, (b) individual, and (c) sociocultural appropriateness. Each of these factors are considered, with particular attention to the
developmental theories of Jean Piaget, Erik Erikson, Howard Gardner, and Lev Vygotsky (Gillespie & Beisser, 2001). Although, Piaget is the theorist most commonly cited with reference to young children's work with computers, LOGO programming by young children is also supported by the theories of Erikson, Gardner, and Vygotsky. LOGO is considered to be a mind tool to support learning process of pupils and is in line with the definition of Jonassen (2000) that the ICT-application can be used to represent knowledge; the experience is generalizable to content in different subjects like mathematics, natural sciences, geography; it engages learner in critical thinking about the subject; it develops skills transferable to other subjects and it significantly restructures or amplifies thinking and it is learnable in 2 hours or less.

LOGO was designed as part of an experiment to test the idea that children can learn through programming. The first research project was closely linked to mathematics and tested the idea that programming might be a useful environment in which to talk about problem-solving. The emphasis of the LOGO project was oriented towards young children with the expectation that programming in LOGO would help them develop mathematical, logical and problem solving skills. To this end, the language was designed to appear natural to the child, friendly, easy to use and jargon-free and provide a motivating environment. The potential of Logo has been extensively studied and most of this research focused on measuring learning outcomes such as mathematics and geometry, the demonstration of metacognitive skills and cognitive skills, next to a strong focus on the acquisition of Logo-programming skills (Chang, 1989; Valcke, 1991). Despite all these laudable potentials of the technology, especially LOGO, teachers are the determinant of its usage. Perceptions of teachers are germane to the integration of technology, Baylor and Ritchie (2002) argued that, regardless of the technology and its sophistication, technology will not be used unless teachers have the skills, knowledge and attitudes necessary to infuse it into the curriculum. Therefore, this study sought to find out teachers perception of LOGO programming inclusion in Computer studies curriculum for primary school pupils in Nigeria.

2. Research Question
The study answered the question on the perception of teachers on the inclusion of LOGO programming language in the computer studies curriculum for primary school pupils

3. Method
A descriptive research design was adopted in this study. Twenty-four (24) computer teachers were randomly selected from primary schools in Ibadan North Local Government Area of Oyo State, Nigeria.

Teachers’ Perception Scale of the LOGO Instructional Package (TPSLIP):- The questionnaire tagged (TPPLQ) was given to experts who assessed the depth of coverage of the instrument, phrasing of the items and relevance. The questionnaire was then administered to 20 primary school computer teachers outside the sample area and Cronbach Alpha was calculated to be 0.89 which implied that the instrument was reliable. It has sections A and B. Section A focused on the bio-data made up of 5 questions which include gender, age, marital status, academic qualification and years of teaching experience in computer studies. Section B consists of 17 items dealing with the teachers’ perception on LOGO Programming Language Package and has the options “Strongly Agree (SA)(4)”, “Agree (A)(3)”, “Disagree (D)(2)” and “Strongly Disagree (SD)(1)”. Data collected were subjected to descriptive statistics such as frequency count, percentage, mean and standard deviation.
4. Results and Discussion
The aim of this study was to find out the perception of teachers on the inclusion of LOGO programming language in the computer studies curriculum for primary schools pupils. In Ibadan North Local Government, Oyo State, Nigeria. Table 1 shows that the teachers’ perception on the use of the LOGO software was positive on thirteen out of the seventeen items listed. These are items 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14 and 17. All the thirteen items yielded high mean scores above 2.50 out of 4.00. Only four items obtained low mean scores (less than 2.5). 75% of the teachers agreed that LOGO software is easy to use, they are in control of the contents of the menus and toolbars and they are able to use all that is offered in the programs. However, about 25% of the respondents believed that using the software raises pupil’s morale. It could be inferred that the LOGO software is not tasking and expensive, but enjoyable and does not make the teaching difficult. On the whole, the weighted average of 3.00 out of 4.00 shows that teachers’ perception on the use of the LOGO software in Nursery and Primary Schools is good.

The finding reveals that LOGO was not tasking, not expensive, not difficult but enjoyable and could be learnt and used in an easy and natural way is also relevant to the findings by Cox et al (1999). This is because all factors considered by Cox et al (1999) that make ICT use easier were also considered as contributing to the continuous use of ICT by teachers in their teaching. These factors are: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable among others. Also, teachers found it easy to demonstrate to the pupils how they can command the LOGO turtle to move and make different shapes and designs.

The perceived usefulness and perceived ease of use influence the perception of the users, while the perceptions predict attitudes toward the technology adoption (Van-Akkeren & Cavaye, 1999). Then the attitude develops the intentions to use and the intentions cause actual system usage. The beliefs, attitude and intention to use manifest when a user is presented with a new technology. These influence the user’s decision regarding how and when they will use it and perceived ease of use determines consumer's attitude toward use, which leads to behavioral intention to use the system and actual use of the system (Davis et al., 2002). Guaranteed total access to the use of computers as teaching tools will provide the technical know-how and ensure that the intellectual ability to manipulate and discover its pedagogical power by teachers is fully utilised (Rafiu, 2009). Baylor and Ritchie (2002) concluded that regardless of the level of educational technological sophistication, it will not be used unless teachers have the skills, knowledge and attitudes necessary to infuse it into the curriculum. The Gordon University Aberdeen (2004) noted that teachers were reasonably confident in ICT usage but needed technical support and professional development to maximise their use of ICT in the classroom. Therefore, teachers should be well equipped to integrate ICT into their teaching (Penuel, 2006).

Teachers also indicated that pupils are more engaged and more motivated to learn in LOGO environment leading to higher-quality work. This is line with the findings of Swan, Kratcoski, Mazzer, Schenker, (2005) that environment facilitates more authentic, collaborative and project-based learning. Barrios, (2004) asserted that ‘only through professional development and with the support of the school leadership can these changes in the classroom occur.’ Teachers now realize that computers and other ICT facilities can enhance teaching and learning because of the greater opportunities to individualise instruction in a learner-centred environment (Dunleavy, Dextert & Heinecket, 2007). Some of the teachers used personal self-development efforts to acquire the needed computer skill conducted by researchers who have more than a casual interest in teaching. Head Teachers frequently visit the computer laboratory to monitor progress. While parents were not frequent visitors to the school, some visited the schools to inquire about the program, and expressed
interest in the work. Essentially the schools demonstrated interest in computer education and offered support for the present study.

Table 1: Perception of teachers on the inclusion of LOGO programming language in the computer studies curriculum for primary schools pupils

<table>
<thead>
<tr>
<th>S/N</th>
<th>STATEMENT</th>
<th>SA (4)</th>
<th>A (3)</th>
<th>D (2)</th>
<th>SD (1)</th>
<th>( \bar{x} )</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This software is easy to use.</td>
<td>75%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>3.75</td>
<td>.46</td>
</tr>
<tr>
<td>2</td>
<td>I am in control of the contents of the menus and toolbars</td>
<td>75%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>3.75</td>
<td>.46</td>
</tr>
<tr>
<td>3</td>
<td>I am able to learn how to use all that is offered in this programs.</td>
<td>75%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>3.75</td>
<td>.46</td>
</tr>
<tr>
<td>4</td>
<td>Navigating through the menus is easy to do.</td>
<td>75%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>3.75</td>
<td>.46</td>
</tr>
<tr>
<td>5</td>
<td>This package is tasking.</td>
<td>-</td>
<td>-</td>
<td>15(62.5%)</td>
<td>9(37.5%)</td>
<td>1.63</td>
<td>.51</td>
</tr>
<tr>
<td>6</td>
<td>The contents of the menus match my needs.</td>
<td>75%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>3.13</td>
<td>.35</td>
</tr>
<tr>
<td>7</td>
<td>Getting started with this version of the software is easy.</td>
<td>62.5%</td>
<td>37.5%</td>
<td>-</td>
<td>-</td>
<td>3.63</td>
<td>.52</td>
</tr>
<tr>
<td>8</td>
<td>Finding the options that I want in the menus is easy.</td>
<td>50%</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>3.50</td>
<td>.53</td>
</tr>
<tr>
<td>9</td>
<td>It is easy to make the software do exactly what I want.</td>
<td>50%</td>
<td>37.5%</td>
<td>12.5%</td>
<td>-</td>
<td>3.38</td>
<td>.74</td>
</tr>
<tr>
<td>10</td>
<td>Discovering new features is easy.</td>
<td>50%</td>
<td>37.5%</td>
<td>12.5%</td>
<td>-</td>
<td>3.38</td>
<td>.74</td>
</tr>
<tr>
<td>11</td>
<td>I get my programming tasks done quickly with this software.</td>
<td>50%</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>3.50</td>
<td>.53</td>
</tr>
<tr>
<td>12</td>
<td>Hardware problems often disrupt the lesson</td>
<td>50%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>25%</td>
<td>2.88</td>
<td>1.36</td>
</tr>
<tr>
<td>13</td>
<td>Using LOGO instructional software to teach is expensive</td>
<td>-</td>
<td>-</td>
<td>62.5%</td>
<td>37.5%</td>
<td>1.63</td>
<td>.52</td>
</tr>
<tr>
<td>14</td>
<td>LOGO software makes lessons more fun.</td>
<td>37.5%</td>
<td>62.5%</td>
<td>-</td>
<td>-</td>
<td>3.38</td>
<td>.52</td>
</tr>
<tr>
<td>15</td>
<td>Using LOGO instructional package in my teaching is not enjoyable.</td>
<td>-</td>
<td>-</td>
<td>50%</td>
<td>50%</td>
<td>1.50</td>
<td>.53</td>
</tr>
<tr>
<td>16</td>
<td>LOGO instructional package makes the lesson more difficult.</td>
<td>-</td>
<td>-</td>
<td>25%</td>
<td>75%</td>
<td>1.25</td>
<td>.46</td>
</tr>
<tr>
<td>17</td>
<td>Using the software raises pupil’s morale.</td>
<td>25%</td>
<td>75%</td>
<td>-</td>
<td>-</td>
<td>3.25</td>
<td>.46</td>
</tr>
</tbody>
</table>

Weighted Average 3.0
5. Conclusion
LOGO programming was applauded in this study, as the teachers expressed satisfaction using the LOGO software in future due to their perception of its utility and educational benefits. They argued for the inclusion of LOGO Programming Language in computer studies curriculum for primary school pupils’ and that it should be introduced to pupils of age six. The teachers also confirmed the Instructional Package is appropriate for the age of pupils as well as in the presentation of illustration and in content sequence.

6. Recommendations
Teachers should be given opportunities to enable them develop skills, confidence and learn strategies to integrate computers into their curriculum and participate in workshops, seminars and local and international conferences that integrate the developmental theory and research regarding computer use with hand-on experiences. Furthermore, technical support should also be available in schools to assist the teachers in solving ICT related technical problems. Also, ICT skills also requires that teachers have time available to work together with their peers to develop their skills.

7. References


