

ASSISTIVE TECHNOLOGY AND PLAY-WAY APPROACH AS DETERMINANTS OF ACADEMIC ACHIEVEMENT IN LEARNERS WITH MILD INTELLECTUAL DISABILITY IN IBADAN, OYO STATE, NIGERIA

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Abstract

The paper investigated assistive technology and play-way approaches as determinants of academic achievement in learners with mild intellectual disability. Three (3) hypotheses were tested at 0.05 level of significance. The first hypothesis shows the degree of freedom (DOF) = (R-1) (C-1) = Row = (5-1)(4-1) = 4 3 = 12 C = Column. The level of significance is 0.05 and tabulated value = 21.0261. This implied that there is a significant relationship between assistive technologies as determinants of teaching /learning process. The second hypothesis showed that the degree of freedom (DOF) = (R-1)(C-1) R = Row = (5-1)(4-1) = 4*3 = 12 C = column. Level of significance = 0.05 and tabulated value = 21.0261. Since the calculated value is greater than the tabulated, the Null hypothesis was rejected. The last hypothesis was that the Degree of freedom (DOF)= (R-1) (C-1) = R =Row = (5-1) (4-1) = 4*3 = 12C-Column.Level of significance = 0.05 tabulated value = 21.0261.Since the calculated value was greater than the tabulated value, the Null hypothesis was rejected. This implies that there is significant relationship between assistive technology and play way approaches as determinants on teaching/learning process of learners with mild intellectual disability. Some of the recommendations made include; curriculum planners should inculcate assistive technology and playing approaches in curriculum development for teacher education in Nigeria among others.*

Keywords: Assistive technology, play-way approach, Learners, Mild intellectual disability, academic achievements.

Introduction

A child who does not achieve what he/she is expected to achieve, leaves a puzzling effects on his or her parents and teachers (Azubike, 2009). The child therefore may get frustrated trying to unravel the reasons behind his/her failure in specific academic subjects. The child may therefore

need to acquire skills that will empower him to live a self-actualized life and to meet the expectation of such society. The challenges learners with intellectual disability encounter either at schools, homes, communities and job places can only be eliminated or reduce minimally through the effective use of assistive technology and play-way approach (Dahaney & Duhaney, 2000). Emma (2011) was of the view that learners with intellectual disability need support services which can benefit them in the classroom than having to keep with other peers who may likely assist him in class routines. Kalu (2019) stated that to meet the educational demands of these learners with intellectual disability, support service should be provided which rely heavily on assistive technology for teaching and learning processes. Kalu (2019) opined that without any iota of doubt, the advancement in today's technological has much to offer to the learners with intellectual disability as these tools are for instruction and as well as independent tools that are capable of compensating for any specific impairment. Kalu also noted that "high-tech" educational tools which includes computerized devices and interactive software from the teaching and learning perspectives offer tremendous remedy in assessment, lesson planning, lesson presentation, record keeping and classroom management as well and capacity for thinking recalling, remembering and willingness to accept the stimuli being presented to the learners, (Kalu 2019). Furthermore Duhaney & Duhaney (2000) opined that assistive technology is a fundamental tool in special needs education because learners with intellectual disability require instruction that can be tailored towards their needs and assistive technology can afford them that type of instruction.

Play-way approach on other hands has been defined as variety of activities ranging from sporting, artistic, cultural, electronic or scientific games extended to all ages (Ahmed, 2018). Despite many benefits that play-way approach brings out in the psychological, physical social and other aspects has to do with activities of entertainment. The development of different aspects of the personality can be achieved by ways other than playing, identifying the needs of learners with mild intellectual disability and finding ways to improve them, help to large extent develop a healthy child as much as his abilities allow. The importance of play therefore help the learners with mild intellectual disability to grow and strength the muscles and help in the movement of blood circulation, revitalization and enhances mental and, psychological growth as well as social development, (Elsayed & Abdul-Nabi, 2004). Oduolowo (2003) maintains that the use of play-way approach as an important educational process in the early childhood education has a long history in western education. Oduolowo (2003) further stated that play approach has been recognize as important since the time of Plato. Plato observed that one can discover more about a person in an hour of play than in a year of conversation (Oduolowu, 2003). Friedrich (1903) in his book the "Education of man" emphasized the importance of play. He observed that play approach is the highest development in childhood for it alone is the free expression of what is in the child mind. Malanie (2003) recognizes the fact that children at early stages of learning can explore and understand social narratives from the inside a vital route to developing social competence. Melanie (2003) concludes that while play approach intervention is aimed especially at children with autism spectrum disorder, it can equally benefit a wider range of children with severe and complex learning needs, social skills deficit to participate more effectively in social world. Therefore this paper investigated assistive technology and play-way approach on academic achievement of learners with mild intellectual disability in Ibadan in Oyo state, Nigeria.

Statement of the problem

Learners with mild intellectual disability exhibit symptoms such as delayed speech development, deficit in memory skills, difficulties learning social skills and rules as well as lack of cognitive ability and psychomotor domains that delays their learning and social development. The resultant effects of these deficits are as a result of sub-normal intellectual development manifesting in different degree in everyday mental performances which also manifest in the form of incomplete development and maturity in reasoning, recalling, remembering and willingness to accept stimuli being presented to them. Learners with mild intellectual disability often have constant difficulty performing activities of daily living independently as well as not being able to perform activities such as self-care, toileting, mobility, bathing, dressing and grooming. Therefore assistive technology and play-way approach can ameliorate the effects of this disability. It is now very obvious that assistive technology and play-way approach appear to hold the major key for learners with mild intellectual disability to be empowered and prepare to be integrated into the society in order to contribute their quotas according to national policy on education revised (2018) and also determine the influence of assistive technology and play- way approach on academic achievement of learners with mild intellectual disability in Ibadan, in oyo state.

Purpose of the study

The general purpose of this study was to determine the extent to which assistive technology, play-way approaches predicts academic achievements of learners with mild intellectual disability in Oyo State, Nigeria.

Specific purposes are to determine:

1. Extent to which assistive technology predicts academic achievement among learners with mild intellectual disability.
2. Influence of play-way approaches on academic achievement of learner with intellectual disability
3. Impact of assistive technology and play-way approaches on effect academic achievement of learners with mild intellectual disability.

Methodology

This research adopted a descriptive survey approach in order to carry out the study on assistive technology and play-way approaches to predict academic achievement of learner with mild intellectual disability.

Population

The population of this study comprised pupils with mild intellectual disability from age nine and above receiving instruction in two special public schools in Ibadan, Oyo state. The schools are

1. HLA school for the Handicapped, Agodi, Ibadan, Oyo state
2. School for the handicapped, Oke-Bola, Ibadan, Oyo state.

The schools were selected as a result of high concentration of pupils with intellectual disability

Sample and Sampling Techniques

Stratified random sampling was used in selecting pupils with intellectual disability from the chosen schools. Stratification was based on the levels of disability (mild, moderate, severe and profound) and age groups.

Research Instruments

The questionnaire consist of twenty item questionnaires centered on the assistive technology and paly-way approach as determinant of academic achievement among learners with mild intellectual disability as well as Slosson's Intelligent Test – 4th edition was used to screened the categories of learners with intellectual disability. The identified pupils with mild intellectual disability by Slosson intelligence test revised (3IT-3R) has intelligent quotient of 56-70.

Validity and Reliability of the Instrument

There was reliability coefficient of 0.96 for the SIT-R for each age level, content validity coefficient ranged from 0.90 to 0.98. Oyundoyin & Oyefeso (2018) determined the reliability coefficient of this instrument and was found to be 0.91. The questionnaire for this study was developed by the researchers and submitted to experts in special education to ensure validity and reliability.

Procedure for Data Collection

The questionnaires were administered randomly to the selected learners with mild intellectual disability in the following schools: HLA School for handicapped, Agodi, Ibadan, and School for the handicapped, Ibadan, Oyo State, Nigeria. The questionnaires were administered to the pupils with the help of their teachers. A letter of introduction was sought from the School of Special education, Federal College of Education (Special), Oyo, which was submitted to the Ministry of Education for permission to the above two public primary school.

Method of Data Analysis

The data were analyzed using chi-square distribution.

Hypotheses

Three hypotheses were formulated and tested at 0.05 level of significance.

H₀₁: There is no significant association between the uses of assistive technology as determinants academic achievement for learners with mild intellectual disability.

H₀₂: There is no significant association between the uses of play-way approach as determinants academic achievement for learners with mild intellectual disability.

H₀₃: There is no significant association between of assistive technology and play-way approach on academic achievement of learners with mild intellectual disability.

Testing of Hypothesis

H_{01} : There is no significant association between the uses of assistive technology as determinant of teaching learning process for learner with intellectual disability.

Table 1.1 Chi –square showing the association between the uses of assistive technology and as determinant for academic achievement among learners with intellectual disability.

Observed (O)	Expected (E)	O-E	(O-E) ²	(O-E) ² /E
14	8.6	5.4	29.16	3.39
13	8.6	.4.4	19.36	2.25
5	8.6	-3-6	12.96	1.5
1	8.6	-7.6	57.76	6.72
10	8.6	1.4	1.96	0.22
5	6.8	-1.8	3.24	0.48
5	6.8	-1.8	3.24	0.48
12	6.8	5.2	24.04	3.98
4	6.8	-2.8	7.84	1.15
8	6.8	-1.2	1.44	0.21
1	3	-2	4	1.3
2	3	-1	1	0.3
1	3	-2	4	1.3
9	3	6	36	1.2
2	3	-1	1	0.3
0	1.6	-1.6	2.56	1.6
0	1.6	-1.6	2.56	1.6
2	1.6	0.4	0.16	0.1
6	1.6	4.4	19.36	12.1
0	1.6	-1.6	2.56	1.6
CALCULATED VALUE				52.58

Degree of Freedom (DOF) = (R – 1) (C-1) R – Row

$$= (5 - 1)(4 - 1) = 4 \times 3 = 12 \text{ C - column}$$

Level of Significance = 0.05

Tabulated Value = 21.0261

Since the calculated value is greater than the tabulated value which do not accept the null hypothesis (H_{01}). This implies that there is a significant association between the uses of assistive technology as the determinant of academic achievement among learners with mild intellectual disability.

There is no significant association between the uses of play-way approached the determinant of academic achievement with intellectual disability.

Table 2 of Chi-square showing significant association between the uses of play-way approach as the determinant of teaching /learning process for learners with mild intellectual disability.

H₀₂: There is no significant association between the use of play way approach and determinants of teaching / learning process of learners with mild intellectual disability.

Table 2. Chi-square showing association between the uses of play way method as the determinants of academic achievement among learners with mild intellectual disability

Observed (O)	Expected (E)	O-E	(O-E) ²	(O-E) ² /E
12	9	3	9	1
11	9	2	4	0.44
11	9	2	4	0.44
10	9	1	1	0.11
1	9	-8	64	7.11
4	5.2	-1.2	1.44	0.28
5	5.2	-0.2	0.44	0.01
6	5.2	0.8	0.6	0.12
7	5.2	1.8	3.24	0.62
4	5.2	-.1.2	1.44	0.28
4	4	0	0	0
4	4	0	0	0
2	4	-2	4	1
1	4	-3	9	2.25
9	4	5	25	6.25
0	1.8	-1.8	3.24	1.8
0	1.8	-1.8	3.24	1.8
1	1.8	-0.8	0.64	0.36
2	1.8	0.2	0.64	0.02
6	1.8	.2	17.64	9.8
CALCULATED VALUE				33.87

Degree of Freedom (DOF) = (R – 1) (C-1) R – Row

= (5 -1)(4 – 1) = 4*3 = 12 C - Column

Level of Significance = 0.05

Tabulated Value = 21.0261

Since the calculated value is greater than the tabulated value the Null hypothesis is rejected. This implies that significant association between the uses of play way method as the determinants of academic achievement among learners with intellectual disability exists.

H₀₃: There is no significant association between assistive technology and play way approach on academic achievement among learners with intellectual disability.

Table 3: Chi-square showing association between assistive technology and play way approach on academic achievement of Learners with mild intellectual disability.

Observed (O)	Expected (E)	O-E	(O-E) ²	(O-E) ² /E
7	2.4	.6	21.16	8.82
2	2.4	-0.4	0.16	0.07
2	2.4	-0.4	0.16	0.07
1	2.4	-1.4	1.96	0.82
0	2.4	-2.4	5.76	2.4
10	7	3	9	1.29
7	7	0	0	0
5	7	-2	4	0.57
10	7	3	9	1.29
3	7	-4	16	2.29
3	6.8	-3.8	14.44	2.12
5	6.8	-1.8	3.24	0.48
7	6.8	0.2	0.04	0.01
5	6.8	-1.8	3.24	0.48
1	6.8	7.2	51.84	7.62
0	3.8	-3.2	14.44	3.8
6	3.8	2.2	4.84	1.27
6	3.8	2.2	4.84	1.27
4	3.8	0.2	0.04	0.01
3	3.8	-0.8	0.64	0.17
CALCULATED VALUE				34.85

$$\begin{aligned} \text{Degree of Freedom (DOF)} &= (R - 1) (C-1) \quad R - \text{Row} \\ &= (5 - 1)(4 - 1) = 4*3 = 12 \quad C - \text{column} \end{aligned}$$

$$\text{Level of Significance} = 0.05$$

$$\text{Tabulated Value} = 21.0261$$

Since the calculated value is greater than the tabulated value the Null hypothesis is not accepted (H_0). This implies that there is significant association between available and effective use of assistive technology and play way approach by teachers as determinants on academic achievement of Learners with mild intellectual disability.

Discussions

The study investigates the impact of technology and play way approaches as determinant of academic achievement among learners with intellectual disability. The findings in hypothesis one was in line with other researchers, like Wehmeyer & Agran (2005), Kalu (2014), Chmiliar (2007), Grandin (2013) and Department for International Development (DFID) (2010) that

indicates that assisting technology include range of technological devices which enable persons with various disabilities build upon their abilities and participate as fully as possible at various environment. Carpenter & Wright (2009) was of the view that assistive technological devices can enable learners with intellectual disabilities access to general education either in the classrooms and other activities of learning. It was reported by Edyburn (2003) that using assistive technology decreases the difficulties that learners with intellectual disabilities faces in process learning. In hypotheses two, there was significant association between the uses of play way approach as determinants of academic achievement for learners with mild intellectual disability. Since the calculated value is greater than the tabulated value, the null hypothesis is rejected. In line with the result of the finding of hypothesis two, Kalu (2014) indicates that some types of play that are suitable to learners with mild intellectual disability are fine skills activities, gross physical activities, manipulative activities, rule governed games and dramatic play. Kalu (2014) opined that these play activities enhances language, emotional, social, physical and creative development among these learners. In other words, play way approaches according to Rathnakumar (2020) opined that play provide unique environment where children engage in self-expression, gain a sense of control and increase awareness of their feelings thought and desires. Oduolowu (2003) maintains that the use of play is important in educational process in early childhood education has a long history in western education. Oduolowu (2003) further indicates that play has been recognized as important since the time of Plato. Oduolowu (2003) stated that Plato observed that you can discover more about a child in an hour of play than in a year of conversations.

The Hypotheses three indicates that there is no significant association between assistive technology and play way approach on academic achievement for learners with intellectual disability. Since the calculated value is greater than the tabulated value, the hypothesis was rejected. Kaster (2005) opined that professional activities involves systematic knowledge and proficiency in any particular field of endeavour. While Ayodele (2007) views profession as applied occupation which involves academic training, while Kalu (2023) was of the view that teacher training is seen as the bed rock for the success of any policy that is introduced in the educational system. In other words, Akubue (1991) opined that the teacher is the seat of accountability in the implementation of any policy towards school programme. Grandin (2013) suggests that teacher professional knowledge, and training enhances the effective use of assistive technology in teaching/learning processes.

Conclusion

From the above, it is obvious that assistive technology and play way approach holds the key for learners with mild intellectual disability to be empowered and prepared for integration in the educational programmes and any other educational engagement in future. Play way approaches has also been noted to be essential components or link to cognitive and social competence. It is reported from the study that play has the capacity to develop skills which expands the child's physical, cognitive and emotional abilities. In other words, assistive technology well initiated can enhance the intellectual, physical and human components which unravel the mysteries of effective learning capacity for special needs. Assistive technology serves two main purposes to support an individual's strength and ability thereby empowers the positive effects of disability and also provide suitable alternative of performing a task. Assistive technology and play way approach as an educational instrument have the ability to enhance possibilities for individuals

with different learning. It is important to note that teachers should work together to develop positive and productive learning environment and therefore utilize assistive technology and play way approaches to enhance learning outcomes.

Recommendations

The following recommendations were made:

1. Curriculum planners should inculcate assistive technology and play approach in curriculum development for teacher education in Nigeria, especially for teachers of learners with intellectual disability.
2. Equipment such as assistive technology devices are cost driven, there is the need for government at all levels to support colleges of education and universities in procuring these devices for the teaching and learning purposes.
3. Government in conjunction with private sector should establish factories to manufacture special equipment such as assistive technology devices to improve teaching/learning process.
4. There can be no meaningful rehabilitation of special needs individuals in Nigeria without legislation. Therefore legislators should legislate enabling laws for that can lead to access to education and equally political participation.
5. There is need for capacity building training for teachers and other categories of staff that can provide education services to learner with mild intellectual disability in Nigeria.

References

- Ahmed, A. (2009). Perceptions of using assistive technology for students with disabilities in the classroom. *International Journal of special education*, 12 (3): 203-215.
- Akubue, A.U. (1991). Classroom organizational management. A five point strategy. Ibadan, Wisdom Publishes.
- Ayodele, S.O. (2007). *Wither the teaching Profession in Nigeria*. Institute of Education, University of Ibadan, Nigeria.
- Azubike, P.N. (2009). *The concept of special education and inclusive education in Nigeria*. In A. Olabisi (Ed), Child care and special needs education in Nigeria, (2) (1): Jos Center for Learning Disability and Audiology.
- Chmiliar, L. (2007). Perspectives on assistive technology. What teachers, health professionals, speech and language pathologists have to say. *Developmental Disabilities Bulletin*, UK.
- Duhany, L.M. & Duhaney, D.C. (2000). *Assistive technology*. Meeting the need of learners with disabilities: *International Journal of Instructional Media*. (27), 393-402.
- Dyal, A., Carpenter, L.B. & Wright, J.O. (2009). *Assistive technology: What every school leader should know*. Houghton Muffin Harcourt.
- Edyburn, D.L. (2003). *What every teacher should know about assistive technology*. Palgrave Macmillan
- El-Saged, A. (2004). *Educational activities for children with special needs*, Cairo: The Anglo-Egyptian Library.

- Emma, E. (2011). *Assistive technology as a tool for reasonable accommodation for persons with special needs education in Nigeria*. In A. Olabisi (Ed.) Child care and special needs education in Nigeria (Vol. 2) (1), Jos center for learning disability and audiology.
- Federal Republic of Nigeria (1981). National Policy on Education (Revised) 2018. Lagos, NERDC Press.
- Grandin, T. (2013). *The autistic brain: Thinking across the spectrum*. NY Houghton Mifflin Harcourt
- Kalu, I. (2014). *Intellectual disability and special needs education: Educational viewpoints* (1st edition), Wright integrated Publishers, Nigeria.
- Kalu, I. (2019). *New perspectives in special education*. A text book for SPC III.: Gloryland Publishers.
- Kalu, I. (2023). Professional knowledge and workforce development for sustainable inclusive education in Nigeria: A Book of Reading in Honour of Oseni Isiaka, Titled: *Special Education Transformation for Sustainable National development*. In O.O. Adesina, G.B. Olorode & B.T. Odedele (ed.) Published by School of Special Education, Federal College of Education (Special), Oyo, Nigeria.
- Kaster, A. (2005). *Professional ethics and collective professional autonomy*. A conceptual analysis, ethical perspectives, Ibadan, Nigeria.
- Lewis, R.B. (1998). *Special education and technology classroom-applications* pacific grove.
- Oduolowu, E. (2003). Play and early childhood education: Implications for caregivers in I. Kalu (ed.), *Child development in Nigeria: caregivers manual*, Ibadan, Loud Books (Publishers), Nigeria.
- Rathnakumar, O. (2020). Play therapy and children with mild intellectual disability. Shaket *International Journal of Education*, 8 (2), pp. 32-42
- Wehmeyer, M.L. & Agran, M. (2003). *Intellectual disability. teaching students using innovation and research-based strategies*. Washington: Pearson publishing, Merrill Prattice Hall.