An Empirical Study on Engaging Special-Needs Children Through the Applications of ICT Learning Design Among Special Educators in South Tamilnadu, India.

Amali Arockia J. Selvi and P. Stella

An empirical study on Engaging Special-needs Children through the applications of ICT learning design among **Special Educators** in South Tamilnadu,India.

Amali Arockia Slevi J
Manonmaniam Sundaranar University
Research Department of Business Administration
XIBA-St. Xavier's College (Autonomous)
Email : amaliselvi@gmail.com

Dr.Stella P
Research Supervisor
Research Department of Business Administration
St. Xavier's College, (Autonomous), Palaymkottai, India
Email: stellajenefa@gmail.com

Abstract

The current research paper proposes a framework of Engaging Special-needs Children through the applications of ICT learning design. While Many Special educational institutes in India are pioneering in developing newer teaching-learning frameworks, it has been observed that Engaging Special-needs Children and developing their skills and knowledge becomes a challenge and a task. Thus, researchers in the current research have articulated the need for engaging special-needs children through ICT enabled learning design. Researchers have used a mixed research method of quantitative and qualitative approach. The analysis of the research divided into three categories firstly using correlation analysis for individual aspects, which are establishing strong and weak relationships among them, secondly, examining different demissions of factor analysis and thirdly grouping of Special educators under cluster analysis indicating their propinquities and similarities. The propinquities of special educators are generic, bundled, high-performing ICT enabled learning design. The outcome of the findings has indicated the applications of ICT enabled learning design among the special educators are viewed in two ways: Teachers with ICT skills have higher performance, Teachers with poor ICT skills are using ICT skills sparingly. Thus, the research has proposed a number of alternatives namely learning-teaching design programs, acquiring more ICT enabled skills and knowledge to empower special-needs children.

Keywords: Information, Communication, Technology, Special Education

Introduction

Information and communication technology have permeated the fields of technology, such as launching satellites, running companies around the globe and also facilitating social networking, in every way of life. New technologies have the potential to update various opportunities for effective student-teacher communication that were not possible earlier Dawes, (2001). ICT in education has the potential to transform teaching as ICT leads to the development of information and skills-based learners through involved, cooperative and collaborative learning. Because of the many advantages of ICT in the educational integration of these technologies in schools, it would be an important step towards improving the quality of the teaching-learning process.

The use of Information and Communication Technology (ICT) in the field of education has brought digital learning revolution. Learning has become easier to the weak students and it has shaped the learning paradigm. It is the hallmark of the education system today in a globalized World, where technology becomes a means to provide digital learning platform. It has been observed that educating Special children with multiple disabilities has become important through ICT interventions. Aksal and Gazi (2015) have argued that ICT has become a medium of development of learning for the special needs children. They explained that the need of implementing strategies of ICT skills in special education shapes the future of the education system. In this research, the special emphasis is laid on "Engaging Special-needs Children through the applications of ICT learning design". Special Children need to be educated with modern means of communication. Drigas and Ioannidou (2013) have articulated that the design of ICT-enabled educative programs to create a platform for the students with special educational needs equal access to education.

The current research paper proposes a framework of Engaging Special-needs Children through the applications of ICT learning design. Special education in India has gained momentum in 21st century with a lot of innovations and curriculum enrichments. While Many Special educational institutes in India are pioneering in developing newer teaching-learning frameworks, it has been observed that Engaging Special-needs Children and developing their skills and knowledge becomes a challenge and a task.

Thus, the 21st century is marked by the advent of a knowledge-based society in which ICT plays a key role. The Government of India has proclaimed 2010-2020 to be a decade of innovation. At school level, the skills of reasoning and critical thinking are laid down. It is desirable that affordable ICT tools and techniques should be integrated directly from the primary stage into the instruction in the classroom, so that students can develop their required skills. The researchers in the current research have articulated the need for engaging special-

needs children through ICT enabled learning design. They engaged special educational learning design strategies and how these are to support Special-needs Children in the context of special schools in South India, Tamilnadu.

Review of Literature: Conceptual note of ICT Paradigm

The review od literature paves a way to understand the concept of Engaging Special-needs Children through the applications of ICT learning design Mahbubur (2017) conducted a qualitative research study that gives prominence to three teacher perspectives on the integration of blind students through the use of ICT in the classroom. Both teachers accepted that the students used to read and write in Braille before using ICT devices, which was time-consuming and reduced the efficacy of the learning process. ICT devices such as recorders and talk keypads encouraged learning as students were able to take review notes, record important parts of class lectures and present their work.   Madasiru Olalere Yusuf. (2015), had acknowledged the level of information and communication technology among student teachers at universities in North Central Nigeria. A total of 638 teachers participated in the study. The instruments used for the analysis was a questionnaire. There was a significant difference between the male and female teachers and have an average level of ICT literacy. Sivasankar (2014) has discussed on the ICT awareness among higher secondary teachers. A sample of 294 teachers was taken using simple random sampling technique. The results show that English-speaking high school teachers, urban teachers, and high school teachers are better at their ICT competencies than their peers. Newton, Norrisa et al. (2014) centered on the expectation of teachers to adapt integrated education policies and procedures in the Bahamas and their participants in adult education. The findings of this study showed that there was a broad misconception of the definition of inclusive education. Second, five key factors that influenced teachers' perception of inclusive education were: (a) lack of training; (b) lack of resources; and (c) administrative support; (d) attituded towards teachers; and (e) lack of / misconception of information on inclusive education.

Beggs (2000) claimed the fear of failure by the teachers caused a lack of trust. On the other h and, he found the limitations in the familiarity of teachers with ICT to make them feel anxiou s about applying ICT tools in the classroom and therefore not confident to use it in teaching.

Newhouse (2002) found that many teachers lacked trust and computer skills and were not ent husiastic about the improvements and incorporation of digital learning associated with integra ting computers into their teaching and learning practices

Al khatib (2007) examined the effect of a training program on the awareness of the characteristics and needs of learning-disabled students of Jordanian classroom teachers. The research also examined whether teachers' tolerance of including these students in their

classroom was affected by the practice. Sixty teachers are divided into two equal classes, each with 30 teachers. Another team was chosen a experimental randomly and the other as the control group. Two methods were created to measure the awareness of educator recognition for inclusion of learning-disabled students. These tools and posttest to the two groups. The author developed a training program focused on growing teacher awareness of students with learning disabilities' characteristics and needs. The curriculum consisted of five units of learning. The experimental group was enrolled for 6- weeks in the training program. UNESCO-IBM (2008) The 153 Member States reiterated in their conclusions and recommendation that " the broadened definition of inclusive education can be seen as   a a general guiding principle for improving sustainable development education, lifelong learning for all and equal access for all level of society to learning opportunities" and member states should prepare teachers by equipping them with appropriate skills and resources to educate diverse student populations and to meet the diverse learning needs of all types of learners by means of methods such as vocational education at school level, pre-service training on inclusion, and training that is attentive to the growth and strength of the individual person. Kyriazopoulou and Weber (2009) have developed a method to track trends towards inclusive training. Within their statutory criteria, they acknowledged the need for education legislation to address the quality of training for educators, psychologists, non-educational workers, etc. with particular regard to the management of diversity. Lombard et al. (1998) conducted an integration survey in 45 states in the U.S.A. found that participants did not feel prepared to meet the needs of their students with disabilities. Such findings have been accompanied by a rising body of literature promoting strengthened and updated teacher education systems to counter the growing movement for inclusive education. Galovic, Dragana et al. (2014) examined the attitudes of pre-school, primary, secondary and school teachers towards inclusive education of children with special educational needs. In addition, the study established a correlation between these attitudes and gender, the level of education, teaching experience, formal training in the field of special education, and the duration and quality of work experience with children with special education needs

Thus, the literature review has enabled the researcher to comprehend the different theoretical, conceptual and empirical insights on the different aspects of ICT Skill integration in curriculum development of learning design among the special education schools. It is evident from the review of literature that there is a scare use of ICT in Special education with the focus on learning design in the context of special schools in India and particularly in South Tamilnadu. There is much scope to verify, corroborate and improvise this aspect with respect to the Indian perspective, particularly to the special education teachers in South Tamilnadu.

Methodological consideration

The review of literature has motivated the researchers to search for an appropriate research design and suited method of investigation of Engaging Special-needs Children through the applications of ICT learning design.

Research Objectives

Research objectives are guiding framework for the entire current research.

1. To examine to examine the overall perspective of variables in context of ICT applications in developing learning design for Special Teachers.
2. To examine how this relationship holds in different control situations like years of operation of Special Schools, Teaching experience in special education.
3. To extract the different dimensions of ICT learning design variables
4. To examine whether Teachers could be grouped on the basis of ICT learning design Propinquities.

Mixed Research design

Researchers have used a mixed research method of quantitative and qualitative approach.

Scruggs, Mastropieri, and Casto (1987) have indicated that Quantitative synthesis of data computation of the special education and its learning variables could enhance the outcome of the research. We have taken 60 variables and made a framework to study the learning design of Special Education with a special reference to ICT application in the context of Special Education Children. We have obtained a satisfactory value of reliability using Cronbach's Alpha (0.922) which signifies the overall strength of the research construct.

Based on a predetermined sample size, a questionnaire survey coupled with follow-up interviews with Heads/Senior Executives of Special Educational institutes has been conducted with a view to examine and analyse the sixty aspects of ICT based learning design and its applications among the special educators. Out of 300 teachers, there were 162 teachers who responded. The researchers used the questionnaires and in-depth interview methods to analyse the importance of applications of ICT skill integration in Special Education.

The analysis of the research divided into three categories firstly using correlation analysis for individual aspects, which are establishing strong and weak relationships among them. This helps us to understand the overall perspectives of variables inter-relationship. Secondly, we could examine the variables in control situations using correlation like schools with more than 10 years of establishment, Schools with less than 10 years, Teachers with more than 5 years in Special Education and Teachers with less than 5 Years. Thirdly, we examine the variables grouped as the demissions using factor analysis and grouping of Special educators under cluster analysis indicating their propinquities and similarities. The propinquities of

special educators are generic, bundled, high-performing ICT enabled learning design. The research has shown the clear evidence of the that there are special schools help their employees to develop and cultivate curriculum design to empower Special-Needs Children.

Result and discussion

Findings are based on objectives that guided researchers to establish results to understand the relationship between the Variables and the close proximity between them.

The objective 1 is to examine the overall perspective of variables in context of ICT applications in developing learning design for Special Teachers. Thus, the first perspective is associated with an examination of the relationships that exist between the different aspects of ICT orientation for engaging Special needs Children.

In the overall perspective, we have observed that the variables like ITC tools, Assessment, Webcam, learning design, team planning, organizational motivation have significant relations with other variables and establishing positive relationship in the context of ICT integration in special education learning and teaching.

Table 1: Overall perspectives

S. No	ICT Aspects	Number of ICT aspects having strategically significant relationships
1	ICT Tools	47
2	Assessment of Learning design	47
3	Learning Design	44
4	Team Planning	43
5	Organizational motivation	43
6	Webcam	43

Firstly, ICT tools have 47 aspects have maximum number of statistically significantly relationships with other aspects. The table 1 indicates that second aspect namely Assessment of Learning design among Special teachers is having strong correlation with other aspects in the research. The table1 reveals that teachers in Special education use assessment system of learning design to enhance their teaching. It is an indication that the use of ICT tools in class room management of special needs children is getting shaped.

Thrid aspect in overall perspective is Learning Design having 44 aspects having statistically significant relationships among Variables. This is also showing the postive direction and negative direction of the variables. The Learning Design aspect is having 44 aspects, out of 44, it has been observed that 31 aspects are having negative correlation and weak statistically significant relationships and these variables are moving in a negative direction. The weak negative correlation indicates that Special educators in Special schools in South Tamilnadu

have to be familiar with ICT based appraoch of teaching-learning and weak relation aspects also indicate the weak structure of ICT based curriculam. The fourth aspect of overall perspective is organizational motivation having higher 43 statistically significantly relationships with other aspects. It has been observed that organization has an important role to play in motivating Special educators to use ICT tools for their teaching instruction purpose and promote a culture of digital technology based class room teaching-learning design.

In Objective 2, we have divided the c educators and the special education schools on the basis of two control situations: years of experiences (Teachers) and years of school establishment (Organization) in Special education.

In control situation 1, Years of experience of teachers with more than 5 years in Special Schools have an impact in their teaching. It has been observed that the Assessment of Learning Design among special educators is having 41 aspects with strong correlation. They are moving positively moving in the same direction. It shows that the teachers are having Assessment of Learning Design being used in their curriculum and helps them to track special needs children and their performance.

Table 2: Years of experiences more than 5 years

S. No	Years of experiences more than 5 years	Number of ICT aspects having strategically significant relationships
1	Assessment of Learning design	41
2	internet	40
3	Interactive tools	39
4	ICT Tools	38
5	Photo vocabulary	38

The table 2 above indicates that Assessment of Learning Design is having strong statistically significant relationships with 41 aspects and coreelation alaysis has showed the positive direction. It has been further validated that Special educators in the current research use assessment of learning design in their curriculum development and enhancing teaching-learning process of special needs children easier and benefiting. The control situation of Schools with more than five years has strong relationships with other aspects.

The second aspect is Internet covering 40 aspects having strong correlation with others aspects. It is matched with many Special schools are using digital medium to organize class room learning. It has been observed that it has 28 aspects as maximum positively correlated.

The third aspect is interactive tools covering 39 aspects. It shows the strength of statistically significantly relationships with other aspects and moving in a positive direction.

In control situation, Years of experiences less than 5 years is having a number of aspects statistically significantly relationships. The table 3 below indicates the aspects having statistically significantly relationships with other aspects.

Table 3: Teachers more than 5 years

S. No	Years of experiences less than 5 years	Number of ICT aspects having strategically significant relationships
1	Team Planning	33
2	ICT Tools	32
3	Learning analysis	30
4	Community support	30
5	vision	29

It has been observed that Team planning has highest number of correlation significance having 33 aspects correlated. It has been noted that Special educators are begin to use Team planning as strategic advantage for the benefit of the group. Special educators are using Team planning as a strategy to understand individual context and learning design. Teachers with less than 5 years of experience in special education are prone to use Team planning as a strategy to educate themselves to familiar with Special education teaching-learning design in the context of group. This indicates that Teachers are working in groups to understand the teaching-learning design.

The second aspect is ICT tools, covering 33 aspects with higher correlation. ICT tools are found be statistically significant. It has been observed that there are two movements namely: positive with 20 aspects and negative 13 aspects. Learning Analysis of ICT based curriculum in special schools of research are given due importance and orientation. The special educators in special schools are using learning analysis as a tool to retrieve information about special children and their learning differences. Learning Analysis could help special teachers to maintain collaborative relationship and goodwill with parents, students and the stakeholders to impart quality education. Learning analysis also involves a framework of understanding the intellectual needs of the special children and cater to their needs according to them of power.

In control Situation, the years of Special school establishment (Organization) in Special education determines the quality of ICT inputs and usage in the school premises and how

School administration helps the special educators to develop their attitude and interests towards the ICT learning design. The first phase, Years of Special School establishment more than 5 years have Assessment covered the aspects

Table 4: the years of Special school establishment (Organization)

S. No	The years of Special school establishment (Organization)	Number of ICT aspects having strategically significant relationships
1	Assessment of Learning design	40
2	Internet Medium	40
3	Interactive tools	39
4	ICT Mechanism	38
5	Photo vocabulary	38

The Years of Special School establishment more than 5 years have Assessment of Learning design with 40 aspects. Assessment of Learning design becomes sole focus as they establish special school with ICT infrastructure. It has been observed that Assessment of Learning design is having higher statistically significantly relationships with other aspects.

Table 5: the years of Special school establishment less than 5 yrs

S. No	The Years of Special School Establishment (Organization) Less Than 5 Yrs	Number of ICT Aspects Having Strategically Significant Relationships
1	Assessment of Learning design	41
2	Internet Medium	40
3	Interactive tools	39
4	Learning Design	39
5	Vision of Organization	39

Institutional ICT learning environment depends on the way in which they adopt the concept of ICT Skill integration in learning-teaching design and help the special teachers to apply them in the context of their teaching among the special needs children. The second aspect is Internet Medium covering 40 aspects with statistically significantly relationships. In this there are two movements namely positive with 18 aspects relationship and 22 aspects are negative. The negative aspects show that there are special schools do not use internet medium for their instructional purposes.

Researchers have identified the ICT intervention strategies used in special school education in south Tamilnadu. The mean values have indicated that the teachers as well as the special school administrations are prone to use ICT mechanisms for instructional purposes.

Table 6: Class room management through ICT interventions					
	N	Minimum	Maximum	Mean	Std. Deviation
ICT familiarity	162	1	5	4.27	1.180
ICT skills	162	1	5	4.44	.834
ICT dependency	162	1	6	4.10	.963
ICT lesson plan	162	1	5	4.11	1.241
ICT application	162	1	5	4.28	.633
ICT adaptation	162	1	5	4.07	.777
Valid N (listwise)	162				

The mean value of the table 6 indicated that ICT familiarity is the higher practised component among the special teachers. The Special schools in South Tamilnadu have used ICT skills to class room teaching effective and efficient. The School administrations in South Tamilnadu are helping special teachers to develop their skills in integrating in to the learning design curriculum and enabling them to become an ICT-conscious person. The current research mean values are indicating that there is a gradual growth of ICT-based approach to teaching and learning.

Cluster wise association of Special Teachers has been done through k-Means clustering and to understand the close association of teachers who share the common platform in teaching and learning.

Table 7: Cluster Propinquity of Special Educators

Number of Cases in each Cluster			Teachers Orientation
Cluster	1	13.000	Teachers with minimum ICT Skills
	2	7.000	Teachers with bundled ICT skills
	3	26.000	Teachers with knowledgeable ICT skills
	4	116.000	Teachers with Higher ICT skills
Valid		162.000	
Missing		.000	

The higher integration of ICT in select schools are empowering teachers to introduce them to the learning and assessment paradigm. The table indicates that Special teachers are having ICT skills. These clusters are grouped based on their close association. The first cluster shows

the association of teachers who have used minimum ICT skills in their teaching. It is the combination of a few ICT skill practices. The cluster analysis of the data has given a direction to understand the teaching-learning design of the special educators. The Table 7 indicates that there are four clusters namely 13 % of special teachers are considered to be with minimum ICT skills, 7 % teachers having bundled ICT Skills, 26 % special teachers having knowledge of ICT Skills and special teachers nearly 60 % are prone to Higher ICT Skills integrated. The special teachers with multilayers of ICT skill integration. The quality of special education depends on the quality of teaching-learning process that special educators develop and integrate in their teaching-learning design. The fourth cluster has higher number of teachers associated and indicates that special teachers are using the various ICT skills of for teaching learning process and promote better learning outcomes among special needs children. The FGD with Special teachers has revealed to align that special Teachers use lesson planning as a vital when using ICTs lesson planning and implement it.

While the current research examined availability of ICT tools for instructional purpose and use, it has been observed that it is enhancing teaching and learning of special teachers.

Table 8: Audio and Video ICT Learning tools					
	N	Minimum	Maximum	Mean	Std. Deviation
Smart class	162	2	5	4.01	.975
webcam	162	2	5	3.93	.949
Talking Calculators	162	1	5	3.91	1.018
ICT software	162	1	5	3.91	1.002
Audiometers	162	2	5	3.86	1.002
Interactive tools	162	1	5	3.79	.968
Photo vocabulary	162	1	5	3.75	.953
Valid N (listwise)	162				

It has been important to conclude that Many of Special Schools in Tamilnadu have adopted the ICT Skills integration. It has been evident that special schools in Tamilnadu are using predominately the aspect of Smart class for their instruction. The use of webcam in School for educational purposes ranks as second and indicates that Internet Medium is used for education. Interactive Tools of ICT is many schools have been found to be weak and appeared to be not in use. It is important for the schools to realize the need for effective interactive mechanism. The school administrations have failed to use ICT-enabled approach in teaching and learning process for special children. The mean value of Photo vocabulary is found to be weak in application in learning-teaching design. The special teachers are faced a number of challenges namely; availability of sufficient number of ICT tools, lack of motivation and support and lack of technical support from the top management.

Conclusion

Today, technology is a part of nearly all aspects of life and learning. Technology often allows business and pleasure work and communication with a strong emphasis on hardware, software, portable devices, and "app." But being mere ICT literate is not enough for teachers. If the special educational sector of our schools in south India is to maintain a balanced standards, the special school administrations have to provide adequate resources like, infrastructural facilities, financial support in term of modern classrooms equipped with ICT-enabled computer systems that are linked to the internet and highly competent personnel that can effectively, utilize these resources to bring the desirable outcomes.

Reference

1. Aksal, F. A., & Gazi, Z. A. (2015). Examination on ICT Integration into Special Education Schools for Developing Countries. *Turkish Online Journal of Educational Technology-TOJET, 14*(3), 70-72

2. Drigas, A. S., & Ioannidou, R.-E. (2013). Special Education and ICTs. *International Journal of Emerging Technologies in Learning, 8*(2).

3. Scruggs, T. E., Mastropieri, M. A., & Casto, G. (1987). The quantitative synthesis of single-subject research: Methodology and validation. *Remedial and Special education, 8*(2), 24-33.

4. Dawes, L. (2001). *What stops teachers using new technology?* In M. Leask (Ed.), Issues in Teaching using ICT,London: Routledge, 61-79.

5. Shavinina, L. V. (2001). A New Generation of Educational Multimedia: High Intellectual and Creative Educational Multimedia Technologies. In L. R Vandervert, L. V. Shavinina & R. A. Cornell (Eds.), Cyber education: The future of Distance Learning. Larchmont, NY: Mary Ann Liebert, Inc, 63-82.

6. Madasiru Olalere Yusuf, Horence Olutune Daramola,Oloyede Soloman Oyelekan.(2015). A study on ICT Literacy among student teachers in Universities in North Central Nigeria. Mevlana International Journal of Education (MIJE). 2015; 5(2):1-12.

7. Sivasankar A.(2014). ICT Awareness among Higher Secondary School Teachers in Tirunelveli District. Role of ICT in *Improving the Q*uality of Institution. Seminar Proceedings, Dept. of Education DDCE, MS University, Tiruvelveli,.

8. Cambridge ,Janelle (2014). Newton *International Journal of Special Education*, v29 n3 p26-37 2014 *2889 Highbury Street, Vancouver, BC V6R 3T7, Canada.*, Norrisa; Hunter-Johnson, Yvonne; Gardiner-Farquharson, Beulah L.; Cambridge, Janelle (2014)

9. Al Khatib, J. (2007). *The impact of training on general education teachers' knowledge and acceptance of inclusion of students with learning disabilities in Jordan*. Insights on Learning Disabilities, 4, 13-21.

10. UNESCO-IBE (2008). *Inclusive education the way of future: Final Report.* Retrieved May 13th 2009, from http://www.unesco.org/en/inclusiveeducation

11. Lombard, R. C., Miller, R. J., & Hazelkorn, M. N.(1998). *School-to-work and technical*

12. Kyriazopoulou, M. and Weber, H. (eds.) (2009) Development of a set of indicators for inclusive education in Europe, Odense, Denmark: European Agency for Development in Special Needs Education

13. Beggs, T. A. (2000): Influences and barriers to the adoption of instructional technology. Paper presented at the Proceedings of the Mid-South Instructional Technology Conference, Murfreesboro, TN.

14. Newhouse, P. (2002): Literature Review: Tha Impact of ICT on Learning and Teaching. Perth, Western Australia: Department of Education.

15. Kyriazopoulou, M. and Weber, H. (eds.) (2009) Development of a set of indicators for inclusive education in Europe, Odense, Denmark: European Agency for Development in Special Needs Education