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Factors that Enhance Flexible Teaching of Learners with Special Needs in South Africa in the COVID-19 Era: Implications for Post COVID-19 Classrooms

Segun Emmanuel Adewoye[1]
[1] Department of Psychology, University of South Africa, South Africa.

ABSTRACT

Notwithstanding the challenges of the COVID-19 pandemic, specifically in the educational system, research indicated that teachers of learners with special needs carried out meaningful teaching activities during the COVID-19 pandemic. Although the different strategies employed by teachers of special needs learners to enhance effective teaching have been thoroughly researched in the field of education, they were not investigated during the COVID-19 pandemic. The purpose of this study was to explore factors that enhance flexible teaching of learners with special needs in South Africa in the COVID-19 era. A phenomenological research design was adopted using a qualitative research approach. Ten teachers were purposefully selected to participate in the study. The interviews were recorded and then transcribed. Inductive thematic analysis was used to analyse the qualitative data. The findings of this study revealed that teachers' characteristic factors such as attitudes towards the use of ICT, prior knowledge of computer use and motivation, and infrastructural factors such as easy access to computers and availability of technology influenced flexible teaching of learners with special needs in the COVID-19 era. The findings of this research contribute to what is hoped will be a continually expanding body of empirical evidence-based insight about effective, flexible teaching strategies that may increase knowledge of the adoption and integration of flexible teaching in the field of education. Being well informed regarding enabling factors that enhance the effectiveness of flexible teaching is essential when designing and providing instruction to learners in a virtual environment. It is recommended that teachers of learners with special needs should gain new information and ICT skills to enable them to adapt from face-to-face teaching to teaching on virtual platforms, especially as educational institutions and research have shifted focus to understanding sustainable post-COVID-19 pedagogical needs.

Keywords: *Flexible teaching, Special needs learners, Special education, COVID-19 pandemic, Remote learning*

Correspondence
Segun Emmanuel Adewoye
Email: adewose@unisa.ac.za

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INTRODUCTION

Following the outbreak of the COVID-19 pandemic, there was an urgency to limit physical contact between people to contain the spread of the virus. One of the more significant changes implemented

to slow down the spread of the virus was the closure of schools globally.[1] Many academic institutions initially hesitant to modify their traditional pedagogical approach were forced to switch completely to flexible teaching and learning in the form of computer-based learning and online teaching strategies.[2]

This remote learning as a new teaching and learning strategy slightly changed how educational content and activities were being delivered in schools. Teachers had to adapt to flexible teaching, which necessitated the use of a variety of digital tools and resources to deliver lessons to students.[3] According to Shurville et al., "Flexible teaching is a set of educational philosophies and systems, concerned with providing learners with increased choice, convenience, and personalisation to suit the learner."[4] In particular, flexible teaching and learning is a student-centred approach that provides students with the choice of what they learn, how they learn, and when and where they learn it.[5]

Transitioning to a virtual setting forced many educators to learn new technologies and skills. In addition to moving to an online learning environment during the COVID-19 pandemic, special educators were faced with multiple challenges ranging from equity issues for students, providing instruction in a virtual environment, and providing special education services as determined in student individual education plans.[6] The shift from face-to-face teaching to sudden online teaching left learners with special needs confronted with more extreme barriers to learning.[7]

Although the government implemented various ways of teaching and learning to ensure that learners continued to learn even under the challenges of the pandemic specifically in the education system, the implementations were insufficient to accommodate learners with special needs.[8] This is because most of the initiatives implemented relied on equipment such as computers, tablets, radio and television, and other digital tools, which may not always be easily accessible to all learners.[9] For instance, learners with special needs may not have learning equipment for optimal learning.[10] In

[1] R. H. Huang et al., *Handbook on Facilitating Flexible Learning during Educational Disruption: The Chinese Experience in Maintaining Undisrupted Learning in COVID-19 Outbreak.* (Beijing: Smart Learning Institute of Beijing Normal University, 2020).

[2] Kui Xie, Benjamin C. Heddy, and Vanessa W. Vongkulluksn, "Examining Engagement in Context Using Experience-Sampling Method with Mobile Technology," *Contemporary Educational Psychology* 59 (October 2019): 101788, https://doi.org/10.1016/j.cedpsych.2019.101788.

[3] Birgit Eickelmann and Julia Gerick, "Lernen Mit Digitalen Medien," in *„Langsam Vermisse Ich Die Schule ..."*(Waxmann Verlag GmbH, 2020), 153–62, https://doi.org/10.31244/9783830992318.09.

[4] Simon Shurville, Thomas (Barry) O'Grady, and Peter Mayall, "Educational and Institutional Flexibility of Australian Educational Software," *Campus-Wide Information Systems* 25, no. 2 (March 28, 2008): 74–84, https://doi.org/10.1108/10650740810866576.

[5] Stephan Gerhard Huber and Christoph Helm, "COVID-19 and Schooling: Evaluation, Assessment and Accountability in Times of Crises—Reacting Quickly to Explore Key Issues for Policy, Practice and Research with the School Barometer," *Educational Assessment, Evaluation and Accountability* 32, no. 2 (May 10, 2020): 237–70, https://doi.org/10.1007/s11092-020-09322-y.

[6] Torrey Trust and Jeromie Whalen, "Should Teachers Be Trained in Emergency Remote Teaching? Lessons Learned from the COVID-19 Pandemic," *Journal of Technology and Teacher Education* 28 (May 1, 2020): 189–99.

[7] Sara Bubb and Mari-Ana Jones, "Learning from the COVID-19 Home-Schooling Experience: Listening to Pupils, Parents/Carers and Teachers," *Improving Schools* 23, no. 3 (November 14, 2020): 209–22, https://doi.org/10.1177/1365480220958797.

[8] Ali Wahab and Manpreet Kaur, "Mediating Educational Challenges amidst COVID-19 Pandemic.," *Asia Pacific Journal of Contemporary Education and Communication Technology* 6, no. 2 (2020): 1–18.

[9] Charlotte McClain-Nhlapo, "An Inclusive Response To Covid-19: Education For Children With Disabilities," https://www.ukfiet.org/2020/an-inclusive-response-to-covid-19-education-for-children-with-disabilities/, 2020.

[10] Carl Cullinane and Rebecca Montacute, "COVID-19 and Social Mobility Impact Brief #1: School Closures" (The Sutton Trust, April 2020). School-Shutdown-Covid-19.pdf (suttontrust.com). (accessed on 4 January 2021).

addition, they may also not have physical support to ensure they have access to the internet and someone to physically assist them with using it to learn.[11]

As learning facilitation is different in special education, the shift from conventional teaching style to remote teaching presented an opportunity to support the learning of special needs through flexible teaching during COVID-19.[12] However, most special education teachers were not prepared or trained for this unexpected change of teaching format.[13] Furthermore, special needs educators who lack technology training and resources face many barriers when teaching students with disabilities in an online environment.[14]

Although the different strategies employed by teachers of special needs learners to enhance effective teaching have been thoroughly researched in the field of education, they have however not been investigated during the COVID-19 pandemic. Therefore, the purpose of this study was to qualitatively examine the factors that enhance flexible teaching of learners with special needs in South Africa in the COVID-19 era with a view to revealing necessary factors needed for flexible teaching and which could be taken into consideration beyond the COVID-19 crisis. In line with this purpose, the specific research question for this study is: What are the factors that enhance flexible teaching of learners with special needs in South Africa in the COVID-19 era?

LITERATURE REVIEW

Several studies have been conducted on factors that influence the effective usage of flexible teaching. For instance, Taat and Francis studied the factors influencing the acceptance of flexible teaching among students in Malaysia. The findings revealed that teachers' characteristics and technical support impact the success of flexible teaching.[15] Meriem and Youssef also conducted a study to identify major barriers to flexible teaching from the teachers' perspective. According to the study's findings, lack of institutional support, lack of technical support, resistance to change and low computer skills were the major factors that caused reluctance in adopting flexible teaching among educators.[16]

Evidence also indicates that the most common obstacles to effective, flexible teaching and learning are access issues, including poor internet connection, insufficient knowledge about the use of information and communication technology and funding issues.[17] Another study revealed that system characteristics, internet experience and computer self-efficacy were the main challenges that impeded the successful adoption of e-learning systems in Pakistan.[18] A similar study in Kenya identified three main challenges of flexible teaching and learning: inadequate ICT infrastructure, lack of technical

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[11] Katherine Schaeffer, "As Schools Shift to Online Learning amid Pandemic, Here's What We Know about Disabled Students in the U.S.," Pew Research Center, April 23, 2020, https://www.pewresearch.org/fact-tank/2020/04/23/as-schools-shift-to-online-learning-amid-pandemic-heres-what-we-know-about-disabled-students-in-the-u-s/.

[12] Nedime Karasel Ayda et al., "Distance Education for Students with Special Needs in Primary Schools in the Period of CoVid-19 Epidemic," *Propósitos y Representaciones* 8, no. 3 (2020), https://doi.org/10.20511/pyr2020.v8n3.587.

[13] Trust and Whalen, "Should Teachers be trained in Emergency Remote Teaching?"

[14] Laura Hamilton, Julia Kaufman, and Melissa Diliberti, *Teaching and Leading Through a Pandemic: Key Findings from the American Educator Panels Spring 2020 COVID-19 Surveys* (RAND Corporation, 2020), https://doi.org/10.7249/RRA168-2.

[15] Muhamad Suhaimi Taat and Agatha Francis, "Factors Influencing the Students' Acceptance of E-Learning at Teacher Education Institute: An Exploratory Study in Malaysia," *International Journal of Higher Education* 9, no. 1 (December 23, 2019): 133, https://doi.org/10.5430/ijhe.v9n1p133.

[16] Bouyzem Meriem and Al Meriouh Youssef, "Exploratory Analysis of Factors Influencing E-Learning Adoption by Higher Education Teachers," *Education and Information Technologies* 25, no. 3 (May 10, 2020): 2297–2319, https://doi.org/10.1007/s10639-019-10075-5.

[17] Than Nwe Aung and Soe Soe Khaing, "Challenges of Implementing E-Learning in Developing Countries: A Review," 2016, 405–11, https://doi.org/10.1007/978-3-319-23207-2_41.

[18] Faria Kanwal and Mariam Rehman, "Factors Affecting E-Learning Adoption in Developing Countries–Empirical Evidence From Pakistan's Higher Education Sector," *IEEE Access* 5 (2017): 10968–78, https://doi.org/10.1109/ACCESS.2017.2714379.

skills and financial constraints.[19] In the same vein, a study by Mulhanga and Lima identified inadequate technical support and lack of IT skills as the primary barriers that hindered the successful implementation of flexible teaching.[20]

Notwithstanding the challenges impeding the effective use of flexible teaching and learning, research also indicated that teachers of learners with special needs carried out meaningful teaching activities during the COVID-19 pandemic.[21] Although the COVID-19 pandemic seems to have affected the continuous teaching of learners with special needs, most of whom require special education services, evidence also suggests that educational content and activities were delivered to learners with special needs.[22]

Previous studies have examined the success factors of effective, flexible teaching. For instance, Chukwuemeka and Dominic reported that knowledge of ICT, leadership support, and availability of resources were prerequisite factors for the effective use of flexible teaching to learners with disabilities.[23] However, according to McGregor, there is less knowledge and a paucity of literature on factors that enabled special education teachers to adapt to flexible teaching during the COVID-19 pandemic. In line with this, this current study aimed to investigate factors that influenced flexible teaching of learners with special needs from the perspectives of educators of special-needs learners.

METHODS

Research approach and design

This study was conducted using a qualitative research approach. According to Basit, qualitative research methods are suited for studies that seek to derive findings from participants' views.[24] Therefore, this method was best suited to develop a deeper understanding of factors that enhanced flexible teaching of learners with special needs in South Africa from the perspectives of special education teachers. The philosophical assumption supporting this research led to adopting an interpretivism paradigm that, by definition, seeks to explain the world through the lens of people's lived experiences.[25] A phenomenological research approach was used because this study aimed to examine the phenomenon of flexible teaching enhancers and its social and contextual implications for post COVID-19 classrooms.

Creswell asserts that phenomenology is appropriate when the phenomenon being studied is difficult to measure and new insights are needed.[26] So, in alignment with the assertion of Creswell and

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[19] John K. Tarus, David Gichoya, and Alex Muumbo, "Challenges of Implementing E-Learning in Kenya: A Case of Kenyan Public Universities," *The International Review of Research in Open and Distributed Learning* 16, no. 1 (January 20, 2015), https://doi.org/10.19173/irrodl.v16i1.1816.

[20] Marangaze Munhepe Mulhanga and Solange Rito Lima, "Podcast as E-Learning Enabler for Developing Countries," in *Proceedings of the 2017 9th International Conference on Education Technology and Computers - ICETC 2017* (New York, New York, USA: ACM Press, 2017), 126–30, https://doi.org/10.1145/3175536.3175581.

[21] Giorgi Basilaia and David Kvavadze, "Transition to Online Education in Schools during a SARS-CoV-2 Coronavirus (COVID-19) Pandemic in Georgia," *Pedagogical Research* 5, no. 4 (April 10, 2020), https://doi.org/10.29333/pr/7937; Thomas Szulevicz, "COVID-19 and Educational Consequences for (Vulnerable) Children from the Perspectives of Educational Psychologists," *Human Arenas*, April 14, 2021, https://doi.org/10.1007/s42087-021-00214-1.

[22] Megan H. Pesch, Megan M. Julian, and Tiffany G. Munzer, "Reflections on Children with Developmental and Behavioral Challenges Who Are Thriving While Sheltering in Place," *Journal of Developmental & Behavioral Pediatrics* 41, no. 7 (September 2020): 506–7, https://doi.org/10.1097/DBP.0000000000000848.

[23] Emeka Joshua Chukwuemeka and Dominic Samaila, "Teachers' Perception and Factors Limiting the Use of High-Tech Assistive Technology in Special Education Schools in North-West Nigeria," *Contemporary Educational Technology* 11, no. 1 (November 14, 2019): 99–109, https://doi.org/10.30935/cet.646841.

[24] Tehmina N. Basit, *Conducting Research in Educational Contexts.* (Continuum International Publishing Group, 2010).

[25] B Morgan and G Pretorious, "Choosing a Topic," in *Complete Your Thesis or Dissertation Successfully: Practical Guidelines.* , ed. J. G Maree (Cape Town: Juta Legal and Academic Publishers, 2012); Maximus Monaheng Sefotho, *Philosophy in Education and Research: African Perspectives.* (Pretoria: Van Schaik Publishers, 2018).

[26] John Creswell and David Creswell, *Research Design : Qualitative, Quantitative, and Mixed Methods Approaches*, *SAGE Publications, Inc. (US)*, 5th ed. (SAGE, 2018).

in keeping with the intent of this research, which was to listen and comprehend factors that enhanced flexible teaching of learners with special needs, a phenomenological research design was utilised to explore the phenomenon as participants narrated it.

Sampling Strategies and Research Participants

For this study, ten special education teachers from Gauteng primary schools who responded to an invitation letter to participate in the study were purposefully selected. The invitation letter was pasted on the school notice board after securing the consent and approval of the school principals. The criteria for inclusion and exclusion were contained in the letter. Participants who met the criteria to participate and were ready and available to participate in the study responded to the invitation and were contacted by the school to explain the purpose of the study to them further. The participants were employed in various school districts teaching special education to students ranging from grades 1 to 12 during the COVID-19 pandemic. The selection of the participants was based on their understanding of the teaching pedagogy of learners with special needs. The participants in this study included three males and three females; they took part in the study over a period of three weeks.

Instrumentation

As Yin pointed out, an interview is a significant source of data gathering in qualitative phenomenological research.[27] As a result, a semi-structured individual face-to-face interview was undertaken to learn more about, understand and characterise the factors that enhanced flexible teaching of learners with special needs in South Africa in the COVID-19 era. McMillan and Schumacher noted that an important feature of qualitative research is that data is collected in natural settings where participants live or work and where they could exhibit their usual behavior.[28] In line with this, the interviews were conducted in the school so that participants could respond naturally and honestly. The interviews were specifically conducted after school hours over a period of three weeks in order not to disrupt any school activities. The interviews were recorded with the participants' permission and informed consent. During the interviews, field notes were taken as a backup plan and a reflective journal was used to keep track of observations. Each interview lasted approximately forty-five minutes.

The participants were asked questions. In line with Burton and Jones' suggestion,[29] the questions were created from literature evaluation, as well as from the objectives of the study and the research question. The participants were given ample opportunities to express their views and experiences regarding the phenomenon under study. For example, they were asked to describe their attitude towards using ICT while teaching special needs learners during the COVID-19 era. The questions were arranged in such a way that each one led to the next. For instance, participants were asked if they felt motivated to continue teaching despite the challenges posed by the COVID-19 lockdown. As a follow-up, participants were then asked to narrate what motivated them.

Procedure

Initial visits to the schools identified as convenience sites were made. The principals of the school expressed willingness to allow the study to be conducted among special education teachers. Thereafter, ethical approval was received from the ethics committee at the author's institution as well as permission from the Gauteng Education Department to undertake the research in the selected school. After getting the necessary ethical clearance, a meeting was arranged with the potential participants to

[27] Robert K. Yin, *Qualitative Research from Start to Finish* (New York: Guilford Press, 2010).

[28] James McMillan and Sally Schumacher, *Research in Education: Evidence-Based Inquiry*, 7th ed. (Pearson, 2013), https://www.amazon.com/Research-Education-Evidence-Based-Inquiry-7th/dp/0137152396.

[29] Neil Burton, Mark Brundrett, and Marion Jones, *Doing Your Education Research Project* (London: SAGE Publications, Inc., 2014), https://doi.org/10.4135/9781473921849.

describe the project and obtain their written agreement. The participants were informed in detail about the purpose of the study as well as the potential gains of participating.

The participants were given a detailed document before the start of the interviews that explained the purpose of the study, the nature of the scheduled interviews, and the types of questions they should expect. This enhanced rapport with the participants. The participants were also told that their personal information would not be shared with anyone and that their privacy would be protected using pseudonyms.

Ethical Considerations

All ethical protocols were observed before conducting this research. Ethics clearance from the author's institution was obtained. Permission to conduct research in Gauteng, South Africa, was granted by the Gauteng Department of Education. Throughout the study, informed consent, confidentiality, and voluntary involvement were all incorporated

Data Analysis

The data were analysed using inductive thematic analysis. According to Braun and Clarke, the aim of using inductive thematic analysis in qualitative research is to examine, identify and record patterns in data.[30] Audio recordings of the interviews and the notes were transcribed. The themes were analysed using a coding process that began with familiarising with the data, producing initial codes, checking for themes, scrutinising the themes, and defining and labelling the identified themes to construct meaningful patterns. Transcripts were reviewed carefully until saturation was reached with the information supplied in each interview session.

After reading and re-reading the interview transcripts, there was enough information to discover and classify codes that represented themes from the data. Then a code was assigned to relevant data quotations. The search continued for possible themes by identifying all of the codes. The codes found to be similar were grouped together and given names. To produce a summary of the candidate themes, a comparison of all the prospective themes was done.

The emerging themes provided useful responses to the research question of this study. To cross-validate the emerging themes, three different and independent coders were used. This process is believed to increase the validity of the themes identified and lowered subjectivity. After each interview, two coders met to discuss notes and compare their findings. Differences that emerged were handled by a third coder, who looked over the undecided response and selected an appropriate category without knowing what the other independent coders had chosen.

A further review of the initial transcripts was done to check if there were any new themes that had not been included in the summaries to ensure that all of the participants' perspectives were sufficiently conveyed. Comments from the reflective notebooks were incorporated in developing the themes. Verbatim excerpts were also used to illustrate each theme. Two more processes were implemented to ensure appropriate data control. Firstly, the participants were required to validate the data results in order to avoid distortion or misinterpretation of the content and context of the data. This was done through member checking, in which participants were allowed during the data analysis to cross-check the themes that emanate from the transcription of the interview in order to confirm that the interpretation of the data truly captured their voices or views about factors that enhanced flexible teaching of special needs learners during COVID-19. Secondly, the data was compared to existing literature to see if any similarities or differences needed to be investigated further.

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[30] Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (January 2006): 77–101, https://doi.org/10.1191/1478088706qp063oa.

FINDINGS AND DISCUSSION

The findings of this study were presented according to the themes generated from the data.

Theme 1: Attitudes of teachers towards the use of ICT

Teachers' attitudes towards the use of ICT influenced the adoption and integration of flexible teaching of learners with special needs during COVID-19 era. Findings of this study show that teachers of special needs learners who participated in the study had a positive attitude toward the use of ICT. Therefore, providing them with ICT facilities influenced the use of flexible teaching as a panacea for transitioning from traditional face-to-face teaching to a virtual setting. Participant 3 stated thus:

> *My belief in using ICT for teaching is that it will enable me to communicate more and maintain a relationship with the learner. I always view the internet, which I believe is part of ICT, as a means of maintaining communication with the learners during the COVID-19.*

Findings from this study indicated that teachers' attitudes towards ICT determined the successful integration of flexible teaching in the process of delivering lessons to special needs learners. Another participant remarked thus:

> *I believe ICT has great potential to transform how teaching is implemented. It provided me the opportunities for greater flexibility, increased interactivity and accessibility for engaging teaching and learning at the individual and group level (P6).*

It appears that the efficacy of flexible teaching is moderated by teachers' attitudes towards the use of ICT. The right attitude towards the adoption of ICT is relevant to the acceptance and success of flexible teaching. This is because affective dispositions are important determinants of teachers' subsequent behaviour. In other words, teachers' attitudes towards ICT affect their enthusiasm for adopting flexible teaching. Therefore, it is important for teachers to develop a positive attitude towards the use of ICT in order to enhance the efficacy of flexible teaching.

Theme 2: Motivation

Nearly all participants indicated motivation and preparedness as one of the factors that influence the efficacy of flexible teaching. The teachers reported that motivation is a significant factor of flexible teaching since it energizes and guides their behaviour towards achieving goals. Almost all participants found a significant connection between intrinsic and extrinsic motivation and adopting flexible teaching despite the challenges it poses. Participant 4 remarked:

> *It interests me in teaching special needs learners using flexible teaching methods because I can interact with them and carry out the teaching and learning process more optimally*

Self-motivation is a key factor in the adoption of flexible teaching and it can aid in making flexible teaching of learners with special needs as successful as possible. Motivation helps direct teachers' attention towards carrying out their teaching tasks even in difficult situations such as those presented during the COVID-19 lockdown. The perception of how simple or difficult the adoption and integration of flexible teaching is can be influenced by teacher motivation. It seems when teachers are motivated, there is a reduction in symptoms of indifference and apathy toward flexible teaching. It could, therefore, be inferred that highly motivated teachers are the most likely to take advantage of flexible teaching strategies even in difficult situations.

Theme 3: Computer literacy level

Computer literacy refers to the knowledge and skills of computer operations required to implement flexible teaching in the teaching and learning process effectively. Participants reported that their skills and knowledge of computers placed them in a better position to adopt and integrate flexible teaching.

Teachers indicated that prior knowledge of the use of computers contributed to the efficacy of flexible teaching. When asked how she was able to make learning fascinating to the special needs learners during the lockdown, participant 2 stated that:

> *I used my computer as instructional materials to create images that will enable learners to understand the contents of the lesson.*

Computer literacy level is significant because it improves teachers' capacity to perform tasks that are required for flexible teaching to be effective. When the computer literacy level of teachers is high, their ICT skills are enhanced, which influences the use of flexible teaching. As a result, teachers become more efficient and have access to information that facilitates better results. The ability to use the computer is necessary to achieve success in flexible teaching. Most participants asserted that the degree to which flexible teaching could be efficient depends on teachers' computer literacy level.

Theme 4:Easy access to computers

It was noted that easy access to computers significantly influenced the efficacy of flexible teaching. The availability and accessibility of computers are required to fully access learning resources needed to implement flexible teaching in the learning and teaching process. In other words, computer access is essential for achieving the interconnection that makes flexible teaching work. Participant 1 remarked thus:

> *The school management offered me the opportunity to acquire my laptop, which assisted me in digital teaching and learning, and this made the transition very easy for me.*

Another participant stated thus:

> *My school assisted in providing computers and basic computer training programmes to support flexible teaching. The access I had to resources such as computers, and the internet were necessary key elements to the adoption and integration of flexible teaching (P5).*

Most of the participants concluded that access to computers significantly contributed to the efficacy of flexible teaching. The main reason for this outcome appears to be the ability to incorporate the use of computers in day-to-day teaching and learning activities. A further reason given on why the accessibility of computers may enhance the success of flexible teaching is that learning and teaching practices involving computers may boost the reasoning skills of learners with special needs.

Theme 5: Availability of technology

Participants in this study highlighted the availability of technological resources such as electronic and digital resources to create materials for learners, including visual schedules, better-enhanced adoption and integration of flexible teaching. The teachers of special needs learners that participated in this study disclosed that they took advantage of the Council for Exceptional Children (CEC) membership to obtain helpful digital and electronic resources, which consequently enhanced flexible teaching. Participant 8 noted:

> *I used videos I obtained from the council so learners could easily understand the subject matter. These videos are meant to enhance the academic achievement of learners with special needs.*

Many participants revealed that instructional activities incorporate technology-enhanced flexible teaching because it helps learners understand their subjects and provides different ways of imparting knowledge, which has a beneficial impact on learners' academic performance. However, they also noted that technology could benefit flexible teaching and learning if teachers and learners

had significant access to it. The participants alluded that flexible teaching becomes interesting for teachers when technology is a routine part of the teaching process.

One of the participants noted that:

I believe incorporating technology to prepare my lessons enhances flexible teaching. I used my mobile phone and computer a lot to look for the information I needed because I could find it quickly.

Technology made it possible to disseminate knowledge instantly and to communicate feedback more quickly and effectively to learners with special needs during the lockdown. Constructive and regular feedback enhanced learners' engagement. The teachers believed that feedback enabled their learners to set greater performance goals. They agreed that Instant feedback made available with the use of technology helped inform their learners about their level of knowledge acquisition and the effort they need to put in place to achieve their goals.

Several studies in the literature, conducted with various sample groups, have reported the efficacy of flexible teaching in enhancing learners' academic achievement.[31] In line with this, this study explored the factors that made flexible teaching of learners with special needs effective during the COVID-19 era. The findings of this study revealed that teacher characteristics such as attitudes of teachers towards the use of ICT, motivation and computer literacy level, as well as technology and infrastructure factor substantially account for the efficacy of flexible teaching of learners with special needs.

These findings correspond to findings from previous research and add to overall knowledge on the significance of teachers' attributes and availability of technological resources on the success of a teaching approach as determined by teaching and learning outputs. For instance, Taat and Francis reported that teachers who successfully adopted and integrated flexible teaching in their teaching activities had a positive attitude towards the use of information and communication technology.[32] On the other hand, Awang et al. reported that teachers who had negative attitudes towards the use of ICT were found to experience difficulties in integrating technology into their teaching activities which consequently affected their acceptance of flexible teaching.[33] Thus, teachers' attitudes toward ICT are a determinant of acceptance and effectiveness of flexible teaching and learning.

Prior knowledge and ability to use a computer efficiently influenced the efficacy of flexible teaching. Based on the findings of this study, teachers of special needs learners who had prior exposure to the use of computers find it more efficient and seamlessly easy to transition to flexible teaching during the COVID-19 era. This finding resonates with the findings of Xie et al., who noted that teachers who already have prior knowledge of computers might display greater interest in flexible teaching because they may already possess the skills required to access teaching materials needed for the successful integration and adoption of flexible teaching.[34]

Findings from this study indicated that teachers' motivation was the catalyst required for transitioning to a virtual setting through flexible teaching during COVID-19 era. Teachers need the

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[31] M. M. Gündoğdu and Agah Tuğrul Korucu, "The Effects of Collaborative Learning Developed with Blog Technology on Reflecting Thinking Skills towards Problem Solving and Motivation Levels and on Academic Success of Secondary School Students.," *Anadolu University Journal of Education Faculty* 2, no. 3 (April 1, 2018): 196–226, https://doi.org/10.17275/per.21.30.8.2; Japhet E. Lawrence and Usman A. Tar, "Factors That Influence Teachers' Adoption and Integration of ICT in Teaching/Learning Process," *Educational Media International* 55, no. 1 (January 2, 2018): 79–105, https://doi.org/10.1080/09523987.2018.1439712.

[32] Taat and Francis, "Factors influencing the students' acceptance of E-Learning at teacher education institute 2: An exploratory study in Malaysia." 133.

[33] Mohd Mahzan Awang et al., "Effective Teaching Strategies to Encourage Learning Behaviour," *IOSR Journal Of Humanities And Social Science (IOSR-JHSS* 8, no. 2: 35–40, accessed November 1, 2022, www.Iosrjournals.Org.

[34] Xie, et.al. Examining engagement in context using experience- sampling method with mobile technology.

motivation to teach. This finding relates to previous studies that found teachers' intrinsic and extrinsic motivation as contributing factors to the efficacy of flexible teaching.[35]

Lastly, the infrastructure factor and availability of technology also influenced the efficacy of flexible teaching. From the findings of this study, it can be concluded that among factors that enhance effective integration of flexible teaching are easy access to computers and the availability of technology. This finding is consistent with the report by Julius, who stated that teachers with easy access to computers and technology were more innovative in their teaching than those with limited or no access.[36] One explanation for this is that easy access to computers increases access to information and teaching resources, which, in turn, increase teaching outputs.[37]

The findings of this study revealed that teachers' characteristics factors such as attitudes towards ICT, prior knowledge of computer use and motivation, also infrastructure factors such as easy access to computers and availability of technology influenced flexible teaching of learners with special needs in the COVID-19 era. The findings of this study will help teachers of special needs learners, facilitators or instructors, as well as other stakeholders to better understand factors that might contribute to the effectiveness of flexible teaching of learners with special needs

CONCLUSION

The outcome of this study suggested that flexible teaching can increase teaching outputs if teachers have a positive attitude towards the use of ICT, are motivated, have prior knowledge of computers and have easy access to computers and technology. Therefore, teachers of learners with special needs should gain new information and ICT skills to enable them to adapt from face-to-face teaching to teaching on virtual platforms, especially as educational institutions and research have shifted focus to understanding sustainable post-COVID-19 pedagogical needs. Although some measures to curtail the spread of COVID-19 such as social distancing, wearing masks, and using sanitisers, are being relaxed in South Africa, the education sector might not have fully returned to the traditional way of teaching since COVID-19 is still present worldwide.

RECOMMENDATIONS

To this end, efforts should be made to accelerate the ICT readiness of special education teachers at all levels through easy access and the provision of computer sets with internet connectivity. ICT facilities should be affordable and accessible to teachers of special need learners to use in the teaching and learning process. To achieve this aim, training on the use of technology applications should be accelerated for teachers of special learners. In addition, workshops and seminars should also be organised for teachers to intimate them with the identified factors that influence the efficacy of flexible teaching in order to enhance effective teaching output.

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ABOUT AUTHOR

Dr. Segun Emmanuel Adewoye is a Post-Doctoral Research Fellow at the Department of Psychology, University of South Africa. He holds a PhD in Educational Psychology, from the University of Pretoria, South Africa. His research interests focus on Teaching and Learning; Cognitive Psychology; Cyber Psychology; Cyber Bullying; Cybercrime and School bullying.