Research in Social Sciences and Technology

Academic Resilience Among Deaf Learners During E-Learning in the COVID-19 Era

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How to cite
Adigun, O. T., & Ndwandwe, N. D. (2022). Academic Resilience Among Deaf Learners During E-Learning in the COVID-19 Era. *Research in Social Sciences and Technology*, *7*(2), 27-48
https://doi.org/10.46303/ressat.2022.8

ABSTRACT

This study aimed to assess the contributory roles of parental involvement (PI), parental acceptance/rejection (PAR), academic self-efficacy (ASE), computer user self-efficacy (CUSE) vis-à-vis gender and the onset of deafness on the academic resilience (AR) of deaf learners who participated in e-learning during the pandemic. The Bioecological Systems Theory provided a framework for the study. Data was collected using a structured questionnaire from 292 (Male: n = 164; Female: n = 128; Mage = 16.5) deaf learners from 3 provinces in South Africa. Data generated was analysed with IBM SPSS 22 and IBM AMOS 26.0 packages. All the fit measures of the SEM fell within the acceptable range ($\chi 2$ = 69.15, df = 28, $\chi 2$/df = 2.46, IFI = 0.91, CFI = 0.94, GFI = 0.93, NFI = 0.96, and RMSEA = 0.062). According to the findings, PAR, ASE and CUSE had a directly significant relationship on the AR of deaf learners who participated in e-learning during the lockdowns. An indirect significant relationship was observed between the latent variables and academic resilience when observed through the onset of deafness. Based on the findings, appropriate recommendations were made.

KEYWORDS

Academic resilience; academic self-efficacy; COVID-19; e-learning; deaf learners; parental involvement

INTRODUCTION

Disruptions to the social order due to the coronavirus disease (COVID-19) are well documented in literatures. Regrettably, while all learners across the globe have been affected by the pandemic, which is unfortunately still ravaging all nations of the world, learners with special needs such as those who are deaf/hard-of-hearing (further herein regarded as deaf) have suffered greater negative effects as a result of the inability to engage and participate in face-to-face learning and teaching. Prior to COVID-19, some past studies note that face-to-face teaching and learning activities are beneficial to learners with special educational needs (Adigun & Ajayi, 2015; Jameel & Bibi, 2016; Lang, 2002). These studies had based their submissions on observed positive behaviour and social interactions among learners with special needs.

Other studies (Adigun, 2017; Long et al., 2007) have advocated for blended learning due to the rapid influx of e-learning apparatus in the educational system. Interestingly, in order to contain the spread of COVID-19, especially in schools, teaching and learning activities for all learners have been largely conducted via online media since the advent of COVID-19; although reactions for and against academic engagements and the online learning participation of learners is gathering momentum in academic discourses (Nikou & Maslov, 2021). The issues of the academic resilience of learners with special needs during the pandemic are yet to receive the research attention needed; thus this current study was designed to bridge the existing research gaps by assessing the contributory roles of some of the identified factors (parental involvement [PI], parental acceptance/rejection [PAR], academic self-efficacy [ASE], computer user self-efficacy [CUSE]) vis-à-vis gender and the onset of deafness on the academic resilience (AR) of deaf learners who participated in e-learning during the pandemic.

Based on the forgoing, this study hypothesised that no significant relationship existed between gender, the onset of deafness, PI, PAR, ASE, CUSE, and AR of deaf learners who participated in e-learning during the lockdowns. Additionally, this study hypothesised that there would be no direct or indirect relationship between PI, PAR, ASE, CUSE, and AR of deaf learners who participated in e-learning during the lockdowns when examined through gender (male, female) and onset of deafness (pre-lingual or post-lingual) of the participants.

LITERATURE REVIEW

Deaf learners and academic resilience

Deafness is a condition that arises from the loss of ones' ability of the organ of hearing to process sound signals. In other words, individuals with deafness may experience significant challenges in receiving and responding to sound signals (Adigun, 2020). Adigun et al. (2021) aver that an individuals' loss of sense of hearing may arise either before or after the acquisition of speech and language (pre- or post-lingual). According to Adigun et al. (2021), individuals with pre-lingual deafness sustain deafness either from birth or before their acquisition of speech and

language; thus they may not have the opportunity to access oral information but they largely express themselves through and acquire information via visual-spatial forms such as sign language, written language and lip reading. Those with post-lingual deafness have earlier acquired and utilised speech and languages for communication purposes before they sustained deafness. Irrespective of the onset (pre- and post-lingual) of deafness, individuals with deafness have communication challenges significant enough to influence their academic, behavioural, emotional and psycho-social wellbeing. The extent to which deafness contributes to the foregoing may differ significantly based on the degree of hearing loss, gender, social capital and resilience, among others (Adigun & Nzima, 2021; Long et al., 2007; Ogundiran & Olaosun, 2013).

Challenges associated with deafness may further aggravate truancy and withdrawal tendencies, elevated psycho-social disorders and incongruous academic performances (Adigun, 2017; Adigun & Nzima 2021; Lalley, 2011; Marschark & Hauser, 2012; Oyewumi et al., 2013) and incomparable academic resilience with non-deaf learners. Resilience refers to the positive ability to manage, negotiate, persevere or adapt to a considerable source of stress. Resilience is a positive adaptation that is capable of restoring ones' mental health by keeping a balance of physical and psychological functioning despite adversities, level of risk, threats or hardship (Wald et al., 2006). In recent times, the concept of 'resilience' is gathering momentum, especially in the wake of COVID-19, and the concept has been examined in different dimensions (Radovanović et al., 2020).

In particular, the transition of academic activities from the face-to-face model to online media due to COVID-19 has presented some significant creative, rapid and unlimited learning opportunities for teachers and learners, irrespective of the locations and learning competence of the online learning participants. On the other hand, the teaching and learning processes via online learning platforms during this pandemic are not without some potential challenges, such as communication gaps, a lack of physical learner-teacher/learner-learner interaction, technical issues, distraction and time management, among others (Bedrossian, 2021; Eva et al., 2020). While academic activities being presented via online learning platforms due to COVID-19 present both opportunities and challenges, learners (especially those with deafness) may need to exert more effort to adjust to online learning environment; hence, the need for all learners, particularly deaf learners, to develop enhanced resilience towards academic activities via the online media may be inevitable.

Notably in this study, academic resilience (AR) among the deaf learners portrays their ability to face difficult academic situations through a framework that addresses potential adversities associated with online learning during the pandemic. A plethora of research evidence on AR and its contributory factors among non-deaf learners in the pandemic is available globally (Bedrossian, 2021; Eva et al., 2020). Reports from past studies among non-deaf learners indicated that both personal and environmental factors account for variations in AR while AR among male and female learners is at variance (Bedrossian, 2021; Mallick & Kaur, 2016; NyamburaMwangi et al., 2018). Among the deaf, the acquisition of literacy skills via e-

learning interfaces can be difficult based on onset of deafness, the linguistic potential of the learners and/or the support received from others (Pappas et al., 2018). However, there exists a paucity of research reports on the academic resilience and associated contributory factors such as PI, PAR, ASE and CUSE among deaf learners during the pandemic; hence the need for this current study which set out to fill the observed research gap.

Parental involvement (PI) and academic resilience (AR) among deaf learners

In South Africa, a large population of deaf learners are born to hearing parents (Ngobeni, 2017). The implication of the foregoing is that there is language variation and bias in the homes of deaf learners. In other words, deaf learners and their parents may have communication difficulties between and among one another. Thus, parents may limit their involvement in their child's academic activities when communication challenges exist. Describing PI, Olaseni (2020) states that PI is the extent to which parents are knowledgeable about, interested in and are willing to take an active role in the various academic activities of their (deaf) children. The involvement of parents in the learning process of a deaf child is germane, not only to the promotion physical and behavioural growth, but also general scholastic activities and the development of resilience. Thus, studies have reported that AR among secondary school learners is a function of the interaction between learners and their families (Olaseni, 2020; Tudor & Spray, 2017). Some other studies note that intense PI provides support for the improvement of their child's academic performance and it positively correlates with self-expectations for academic success and resilience (Gizir & Aydin, 2009; Olaseni, 2020).

Luft (2011) states that an absence of clear and concrete communication between and among parents and their deaf children may aggravate the traumatic experiences and learning difficulties of deaf learners. Antia et al. (2009) thus note that PI in child's education has a significant and direct correlation with student and teacher ratings of students' social behaviour and resilience capacity. In their studies, Calderon (2000) and Luckner and Velaski (2004) found strong evidence that supported a direct and positive relationship between PI and the outcomes of deaf children over and above factors (such as parental level of education and socioeconomic status) that are traditionally thought to dictate a child's academic success and resilience. Contrary to the evidence provided by Antia et al. (2009), Antia et al. (2011), Calderon (2000), Luckner and Velaski (2004), Jackson and Turnbull (2004), a recent study reported no association between PI and academic performance due to resilience of both male and female deaf learners in Uganda (Akellot & Bangirana, 2019). On the other hand, research evidence provided by Antia et al. (2009), Antia et al. (2011), Calderon (2000), Luckner and Velaski (2004), Jackson and Turnbull (2004) showed that the onset of deafness has no significant association with the academic resilience of deaf learners; although the onset of deafness may have a relative implication on the academic achievement of deaf learners (Ogundiran & Olaosun, 2013).

While lockdowns due to COVID-19 persisted, parents and deaf learners alike had ample opportunity to bond and interact with each other. Interestingly, parents had additional

responsibilities of being a teacher/tutor to their deaf children. Until now, the implications of PI on AR towards academic activities among deaf learners, especially during the pandemic, were unknown. Desjardin (2005), in a study among some children with pre-lingual deafness, found that PI was a significant determinant of academic tenacity and development. Calderon et al. (1998) allude that the involvement of parents in children's academic activities differs based on the onset of deafness. Parents of children with post-lingual deafness spent limited time in intervention programs when compared to parents of children with pre-lingual deafness, and as a result, the resilient potentials of such children remain incomparable (Calderon et al., 1998). Desjardin (2005) avers that parents' active participation in early intervention programmes for children with pre-lingual deafness. Similarly, Yoshinaga-Itano (2000) and Zolkoski et al. (2018) assert that irrespective of gender, nature or severities of a child's disabling conditions, the involvement of parents in everyday academic, behaviour and/or social activities of a child serves not only as a significant protective factor but also helps the child to build resilience to several phenomenal challenges. Other studies have shown that home-based PI positively influences academic achievement resilience, helps to build self-esteem and it enhances the positive socially acceptable behaviour of school-going children (Benner et al., 2016; Manz et al., 2014). It is worthy of note that most of the previous studies that have assessed the implications of PI on the AR of school-going children were conducted pre-COVID-19. In addition, aside from the fact that most of such studies did not consider deaf learners, they focused their research attention on the AR of learners in the face-to-face traditional mode of learning; hence a great research gap exists, not only in examining the role of PI on the AR of learners who participated in online learning activities during the pandemic but also on how PI influences the AR of deaf learners who participated in e-learning activities during the lockdowns occasioned by COVID-19.

Parental acceptance/rejection (PAR) and academic resilience (AR) among deaf learners

Until now, no research evidence has proven immunity against the possibilities of a family having a child with a disability. Past studies have reported that the presence of a child with a disability in a family inevitably comes as a shock to every member of the family (Adigun, 2017; Lalley, 2011) with a resultant perceived negative effect on normal family cohesion and routine, socio-economic and marital stabilities. In particular, parents of children with deafness may experience psychological dysfunction due to the uncertainties presented by the communication difficulties with their children and thus may have difficulty adjusting to the presence of a deaf child (Marschark & Hauser, 2012). Studies have shown that childhood disabilities are stressors to parents (Feizi et al., 2014; Scherer et al., 2019) and many parents, especially fathers, mostly tend to shy away from owning up to having a child with a disability (Feizi , et al., 2014). In recent times, issues of the acceptance or rejection of children with disabilities by parents and its implications on the child's academic endeavours and psychosocial adjustment is being re-echoed in research studies. For instance, Aydın and Yamaç (2014) posit that the PAR of children with disabilities may influence the child's social and behavioural adjustment.

Described as a form of warmth dimensions of parenting, Aktar et al. (2013) further note that PAR is a continuum which describes the quality of the affection, bond and relationship existing between parents and their children with disabilities. Irrespective of gender, the onset of hearing loss or culture, every child needs to enjoy parental acceptance, care, love, and positive reinforcement (Rohner et al., 2005). However, when the aforementioned is not met, children tend to grow in hostile home environments, develop impaired self-esteem and may have difficulties attaining an expected academic level. In the last two decades, PAR has been theorised to inform socialisation and lifespan development (Rohner & Khaleque, 2006; Rohner et al., 2012); although its implication on AR, particularly among deaf learners, is yet to be examined and established in extant literature. Other studies have shown, however, that PAR can predict and explain the major causes and consequences of rational and irrational behaviour among children (Rohner & Khaleque, 2006; Sart et al., 2016). According to Dwairy (2010); and Mendo-Lázaro et al. (2019), unlike parental rejection, parental acceptance is associated with greater psychological adjustment and positive academic achievement. As indicated by Rohner (2004), variation existing in the construct of PAR may be responsible for a child's preparation towards meeting, dealing with and overcoming life challenges, thereby causing an individual to develop realistic life expectations and goals. It was hypothesised in this study that PAR may have an association with the development of AR in deaf learners, especially during COVID-19.

Academic self-efficacy (ASE) and academic resilience (AR) among deaf learners

Every individual, irrespective of hearing acuity, gender or race has a level of efficacy, competencies and capacities to achieve a specific task (Adigun, 2020; Oyewumi et al., 2013). A self-efficacious individual has capacities to endure and persist with a particular task until completion and success is achieved. Self-efficacy is a construct embedded in the Social Learning Theory (Bandura, 1989) which postulates that success rates and behaviour towards a particular phenomenon is defined by an existing relationship between an individual's thoughts and an assigned task. The construct of 'self-efficacy' has been applied to educational activities as 'academic self-efficacy' (Adigun & Nzima, 2021; Zimmerman, 2000; Zhu et al., 2011). The term 'academic self-efficacy' according to Adigun and Nzima (2021), as well as Zimmerman (2000), is used to describe a learners' conviction and perception of their capacity and competence to perform excellently in designated face-to-face or digitally facilitated teaching and learning activities. Regrettably, learners who are deaf have relatively lower academic successes when compared with their hearing peers (Traxler, 2000). Lower academic successes and resilience towards attaining high academic successes among deaf learners has been attributed to dwindling or impaired academic self-efficacy (Adigun & Nzima, 2021) as well as a lack of or a lower level of active and conscious involvement of parents in the education of their deaf children.

Drawing from the Social Cognitive Theory (Bandura et al., 2001) as well as Kim (2020) notes that learners' AR, especially in this pandemic, is largely dependent on an individual's ASE.

Amitay and Gumpel (2015) have indicated that the self-efficacy of an individual can change over time. Academic failure and impaired ASE can have a negative resultant influence on teaching and learning activities and social and emotional beliefs, especially when motivation and support is absent (Bandura, 1993). While a higher level of ASE may inform motivation and positively impact learners' perseverance, commitment and resilience to online learning participation, a lower level of ASE may negatively impact academic aptitude and may increase the symptoms of depression and anxiety, especially among deaf learners (Adigun & Iheme, 2020; Adigun & Nzima, 2021).

Computer user self-efficacy (CUSE) and academic resilience (AR) among deaf learners

The usage of computers for communication and interaction, even among the deaf, has increased geometrically in the last decade. Interestingly, the pandemic and the resultant lockdowns have significantly influenced the wide usage of computer devices, not only for communication but also for e-learning and teaching. Past studies have shown that computer-mediated teaching assists in shaping, refining and integrating deaf learners into various global learning opportunities (Adigun, 2020; Adigun & Nzima, 2020). Not only does learning via computer-assisted instruction enhance learning opportunities for deaf learners (Adigun, 2020), it also makes learning attractive and interactive. Using combinations of graphics, sounds, text and videos, deaf learners tend to stay longer with digitalised teaching and learning approaches (Adigun, 2020; Yenice, 2006). Research evidence provided by Zazove et al. (2004) has revealed that the resilience of deaf learners towards computer-mediated teaching and learning is associated with the aetiology and onset of deafness as well as language abilities. Although Zazove et al. (2004) could not provide an explanation for the influential role of the aetiology of deafness on computer usage among their study participants; they noted that the vocabulary gained by deaf learner could increase their resilience towards online learning.

Irrespective of disabilities, some previous studies have shown that individuals have a sense of self-efficacy for computer use; thus Compeau and Higgins (1995) note that CUSE refers to "a judgment of one's ability to manipulate and use a computer for a specific or multitude of assigned tasks". Computer user self-efficacy has been identified to have a relationship with anxiety, performance, resilience and satisfaction (Compeau & Higgins, 1995; Sun & Rueda, 2012; Torkzadeh et al., 2006). Findings reported by Bates and Khasawneh (2007) have established a correlation between learners online academic engagement, their AR and their performance. However, Sun and Rueda (2012) reported a non-significant direct effect of CUSE on students' academic engagement, resilience and academic stimulation. According to Sun and Rueda (2012), their findings when compared to those of Bates and Khasawneh (2007) may be informed by mediation variables and outcome expectancy. In other words, mediation variables may be a central factor that increases the prediction of CUSE on academic engagement and resilience towards e-learning.

Current study

The outbreak of COVID-19 and its associated social distancing measures came as a surprise to many deaf learners, especially in Nigeria, South Africa and many other Sub-Saharan African nations (Adigun et al., 2021). The aforementioned was largely due to a lack of and/or delay in dissemination of the required COVID-19 information available to the deaf communities; hence, COVID-19 necessitated the migration of academic activities, engagements and learning participation to a digital space. Lamentably, COVID-19 did not only aggravate loneliness, seclusion, and many other traumatic psychosocial experiences; the resilient capacities towards digitalised teaching and the learning activities of many learners with disabilities, especially the deaf, were threatened. Unfortunately, until now, recent research endeavours since the emergence of COVID-19 among the deaf population have focused largely on the challenges of digital learning and academic performance of the deaf learners who participated in online learning (Alshawabkeh et al., 2021; Lynn et al., 2020), with little or no existing research efforts, especially in South Africa, which have assessed the factors that may influence academic resilience among the deaf learners who participated in e-learning during the lockdowns.

Anchored on Bronfenbrenners' (1979; 2005) Bioecological Systems Theory, which assumes that the capacities and development of an individual are influenced by environmental conditions through five subsystems (microsystem, mesosystem, exosystem, macrosystem, and chronosystem), this study investigated the contributory roles of PI, PAR, ASE, CUSE (latent variables) vis-à-vis gender and the onset of deafness (moderator variables) on the AR (dependent variable) of deaf learners who participated in e-learning during the lockdowns. The Bioecological Systems Theory places emphasis on an individual's own biological makeup as a primary environmental factor that is capable of fuelling interactions with external environmental factors that further influence personal development (Adigun, 2021; Muzata, 2020). Hence, we believed that during the lockdowns, deaf learners had ample time to interact within the home environment and parents also had ample opportunities to interact with their children during e-learning processes. This interaction, coupled with learners' academic and computer user self-efficacies, could have influenced academic resilience towards online learning participation.

Based on the conceptual model (Figure 1), this study hypothesised that no significant relationship existed between gender, the onset of deafness, PI, PAR, ASE, CUSE and the AR of the deaf learners who participated in e-learning during the lockdowns. Also, this study hypothesised that there would be no direct or indirect relationship between PI, PAR, ASE, CUSE and the AR of the deaf learners who participated in e-learning during the lockdowns when examined through the gender (male, female) and onset of deafness (pre-lingual or post-lingual) of the participants.
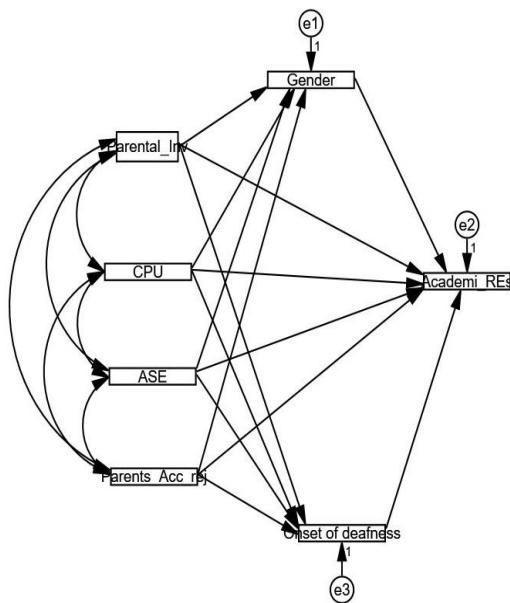
Figure 1. Hypothesized model (Source: Authors, 2022)

Note: Parental_Inv – parental involvement, Parents_Acc_rej- parental acceptance/rejection, ASE – academic self-efficacy, CPU – Computer user self-efficacy

METHODS AND MATERIALS

Design and participants

A descriptive quantitative research design was adopted for this study to examine the contributory and predictive roles of PI, PAR, ASE, CUSE vis-à-vis gender and the onset of deafness on the AR of deaf learners who participated in e-learning during the lockdowns. A total of 292 deaf learners (Male: n = 164; Female: n = 128) who participated in e-learning during the lockdowns participated in the study. Participants were aged 13 to 20 years (Mage = 16.5; SD = 3.5). Deaf learners in grades 8, 9 and 10 were purposively selected for the study across three provinces [Gauteng, n = 89 (30.5%); KwaZulu-Natal, n = 147 (50.3%); Eastern Cape, n = 56 (19.2%)] which were randomly sampled out of the nine South African provinces. A total of 195, which represents about 66.8% of the study participants, were learners with pre-lingual deafness; while 97 (33.2%) others were learners with post-lingual deafness. Amongst the study participants, about 129 (44.2%) had intact families, meaning that both parents were living together; 87 (29.8%) lived with their mothers; 31 (10.6%) with their fathers; while 87 (29.8%) lived with their grandparents or foster parents. Interestingly, at the time of data collection, all participants had access to internet enabled computers/phones/tablets/iPads which they had been using during their online lessons.

Research Instrument

In addition to the above-described demographic information obtained from the participants, other measures employed for data collection in the study were:

Computer User Self-Efficacy scale (CUSE)

The 30-item (13 positively and 17 negatively worded) Computer User Self-Efficacy scale (Cassidy & Eachus, 2002) was adapted for this study. The scale was originally designed in a 6-point Likert scale format but was reconstructed in this study to a 4-point Likert scale format of 1- Strongly disagree to 4- Strongly agree. During data coding, all negatively worded statements such as "I seem to waste a lot of time struggling with computers" and "Computers are far too complicated for me" were reversed. Although Cassidy and Eachus (2002) reported a reliability coefficient of 0.94, our revalidation of the CUSE among some deaf learners who were not part of the study gave a Cronbach's alpha of 0.89.

Parental Acceptance-Rejection/Control Questionnaire - Short Form (PARQ/Control-SF)

The child version of PARQ/Control-SF (Rohner, 2005) was adopted for this current study. The child version of PARQ/Control-SF is a self-report questionnaire designed to assess children's perceptions and retrospective remembrances of the degree to which they experienced parental acceptance or rejection. We used the child version of PARQ/Control-SF to measure the frequency of perceived parenting behaviours towards the online learning participation of deaf learners. Participants rated items for their parents on a modified Likert scale of 1 - Never or almost never to 4 - Every day. The child version of PARQ/Control-SF consists of statements that assess warmth and affection, hostility and aggression, indifference and neglect, as well as undifferentiated rejection. Past studies reported reliability coefficients greater than 0.7 (Daganzo et al., 2014; Rohner, 2005). A revalidation of the child version of PARQ/Control-SF revealed an internal consistency value of 0.71.

Academic Self-Efficacy Scale (ASES)

We adapted the Jinks and Morgans' (1999) students' self-efficacy scale for this study. The adapted ASES was a 20-item questionnaire which was designed in a 5-point Likert scale ranging from 1- Almost never to 5- Almost always. Some of the items of the scale read as follows: "I work hard in school", "I could get the best grades in class if I tried enough" and "It does not matter if I do well in school". A revalidation of the ASES was determined using Cronbach's alpha and it was found to be reliable at 0.73.

Parental Involvement Rating Scale (PIRS)

The study adapted the PIRS developed by Naseema and Gafoor (2001). The adapted PIRS was a 25-item questionnaire which had items such as "My parents do enquire about my academic works" and "My parents/guardians always encourage me to do well in my school assignments". Participants had options of "Always True", "Sometimes true" or "Never True" against each statement of the adapted PIRS. A revalidation of the adapted PIRS revealed an internal consistency value of 0.68.

The Academic Resilience Scale (ARS-30)

This study adapted the ARS-30 which was developed by Cassidy (2016). Some statements in the ARS-30 were reworded. Such statements included: "I would begin to think my chances of success at university were poor" and this was changed to "I would begin to think my chances of

success at online learning activities were poor". The ARS-30 is a context-specific instrument that assesses the academic resilience of students in times of academic adversity. The ARS-30 which was designed in a four-point Likert scale of 1- Strongly agree to 4- Strongly disagree included both positively and negatively phrased statements to elicit cognitive-affective and behavioural responses from the study participants. A revalidation of the adapted PIRS revealed an internal consistency value of 0.78.

Data collection procedure

We used a snowball approach (Atkinson & Flint, 2001) for data collection after approval for the study was received from the institutional review board. All of the aforementioned instruments (CUSE, child version of PARQ/Control-SF, ASES, PIRS and ARS-30) were included in a Google form. The link to access the questionnaire was shared among the participants through the teachers, friends and families of the deaf, WhatsApp contacts and other relevant social media platforms. The link remained active for a period of eight weeks. The use of online surveys was considered appropriate during COVID-19. Participants were guaranteed anonymity and confidentiality of their responses. While we understood the dynamics of the South African population and the variance in home languages, the questionnaire was constructed in the English language. Participation in the study was voluntary.

Data analysis

Data collected was analysed using both descriptive statistics of frequency counts, simple percentages, mean and standard deviation, as well as inferential statistics involving Pearson's product moment correlation coefficient and structural equation modelling. The IBM SPSS statistical software version 22.0 for Windows was used. Descriptive statistics were used to analyse the demographic information of the participants, while Pearson's Product Moment Correlation coefficient was employed to determine existing relationships between PI, parental acceptance/rejection, academic self-efficacy, computer self-efficacy vis-à-vis gender and the onset of deafness on the academic resilience of the deaf learners who participated in e-learning.

The IBM AMOS version 26.0 was used to present the direction of the predictive abilities of PI, parental acceptance/rejection, academic self-efficacy, computer self-efficacy vis-à-vis gender and the onset of deafness on the academic resilience of the deaf learners who participated in e-learning. The IBM AMOS was used to develop the hypothesised model (Figure 1) and used to perform the structural equation analysis (Figure 2).

RESULTS

Hypothesis 1: There would be no significant relationship between gender, the onset of deafness, PI, parental acceptance/rejection, academic self-efficacy, computer self-efficacy and the academic resilience of the deaf learners who participated in e-learning.

Table 1: Correlational matrix of variables of the study

Variables	M	SD	1	2	3	4	5	6	7
Academic resilience	70.91	13.02	1	-0.010	0.053	-0.262**	0.126*	0.152**	0.168**
Gender	1.43	0.49		1	-0.017	0.055	0.099	-0.079	0.071
OD	1.54	0.49			1	0.27	0.97	-0.40	-0.016
PI	29.39	6.50				1	0.092	-0.010	-0.017
PARC	84.84	10.89					1	0.034	0.217**
ASE	54.73	6.63						1	0.096
CPU	36.93	4.35							1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Note: OD = Onset of deafness, PI – PI, PARC - parental acceptance/rejection, ASE – Academic self-efficacy, CPU – Computer user self-efficacy

Table 1 shows the relationships between the pairs of variables in the model. As shown on Table 1, gender (r= -0.010, p > 0.05) and the onset of deafness (r= 0.053, p > 0.05) had no significant relationship with the AR of the study participants. Table 1 also revealed that PI had a negative but significant relationship with the AR of the study participants (r = -0.262, p < 0.01); PAR (r = 0.126, p < 0.05); SE (r = 0.152, p < 0.01) and CUSE (r = 0.168, p < 0.01) had a positively significant correlation with the AR of the study participants. This finding implies that a decline in the PI in deaf learners' participation in online academic activities may have negatively influenced the resilience of learners towards the completion of online academic tasks; whereas an improvement in PAR, ASE and CUSE may further enhance the AR of deaf learners towards online learning.

Hypothesis 2: There will be no direct or indirect relationship between PI, PAR, ASE, CUSE on the AR of the study participants when examined through gender and the onset of deafness of the participants.

Structural equation modelling (SEM) using AMOS 26.0 was conducted to establish the accuracy of the hypothesised model that explained the contributory roles of PI, PAR, ASE and CUSE vis-à-vis gender and the onset of deafness on the AR of deaf learners. Also, in order to validate the compatibility of the empirical data collected, the fit model was determined. As stated by Bentler (1990), large values for the Tucker–Lewis index (TLI), the Incremental Fit Index (IFI) and the Comparative Fit Index (CFI) indicate a good fit model. Therefore, values of ≥.90 were denoted as the indication of a fit model. Also Senol-Durak and Durak (2011) note that root-mean-square error of approximation (RMSEA) values of .06 or lower indicate a close fit, .08 a fair fit, while .10 indicates a marginal fit for a model. A Chi-square (χ2) ratio to a degree of freedom (df) less than 3 also shows a good fit model (Senol-Durak & Durak, 2011).
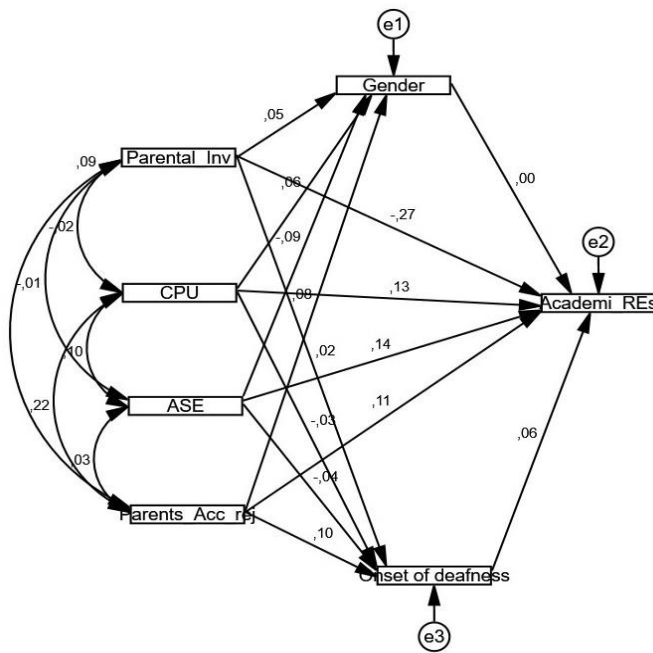
Figure 2: Structural equation model.

Table 2. Structural model values

Relationship between variables	Estimates	S.E.	C.R.	P
Gender ← PI	.004	.004	.820	.412
Gender ← CUSE	.007	.007	1.046	.296
Gender ← PAR	.004	.003	1.400	.161
Onset of deafness ← ASE	-.003	.004	-.691	.490
Onset of deafness ← CUSE	-.004	-.007	-.580	.562
Onset of deafness ← PI	.001	.004	.276	.783
Onset of deafness ← PAR	.005	.003	1.744	.081
Gender ← ASE	-.007	.004	-1.498	.134
Academic resilience ← Gender	-.085	1.448	.059	.953
Academic resilience ← Onset of deafness	1.468	1.435	1.023	.306
Academic resilience ← PAR	.136	.068	2.001	.045*
Academic resilience ← ASE	.256	.108	2.451	.014*
Academic resilience ← CUSE	.380	.169	2.254	.024*
Academic resilience ← PI	-.541	.110	-4.916	***

*** Statistically significant relationship between variables at 0.001 level

* Statistically significant relationship between variables at 0.05 level

Based on the SEM (Figure 2), our study found that all fit measures fell within the acceptable range ($\chi2$ = 69.15, df = 28, $\chi2$/df = 2.46, IFI = 0.91, CFI = 0.94, GFI = 0.93, NFI = 0.96, and RMSEA = 0.062). The model (Figure 2) showed that PI (β = -0.27, $p < 0.05$), PAR (β = 0.11, $p < 0.05$), ASE (β = 0.14, $p < 0.05$), and CUSE (β = 0.13, $p < 0.05$) had a directly significant relationship on the AR of the deaf learners. Similarly, the independent variables (PI: β = -0.27, $p < 0.01$; PAR: β = 0.11, $p < 0.05$; ASE: β = 0.14, $p < 0.05$; CUSE: β = 0.13, $p < 0.05$) had a significant indirect relationship through the onset of deafness (β = 0.06, $p < 0.05$) on the AR of the deaf learners who participated in e-learning activities during the lockdowns. However, no indirect relationship was observed between all of the independent variables on the AR of the deaf learners when examined through gender. The finding further implied that ASE had the highest contribution of about 14% to the variance in the AR of the study participants. In other words, participants with higher efficacy for academic activities had a higher potential for AR during e-learning. This was followed by CUSE and PAR which contributed about 13% and 11% respectively, while PI had a negative (-27%) influence on the development of the AR of deaf learners. This finding further showed that less involvement of parents in online academic activities of deaf learners may grossly impair their academic resilience potentials.

DISCUSSION

Findings of this study revealed that PAR, ASE and CUSE had a positively significant correlation; while PI had a negative but significant relationship with the AR of the study participants. This finding implies that a positive and enabling psychosocial environment could further enhance the AR of deaf learners towards online learning activities. The current finding corresponds to research evidence provided by Aktar et al. (2013), Ali (2011), Rohner and Khaleque (2006), and Sart et al. (2016) who allude that warmth within the home environment and the quality of the affection, bond and cordial family relationship between parent/family members can improve the psychosocial functioning of children with disabilities. Aktar et al. (2013) affirm that irrespective of the onset of the disabling condition or gender, children with special educational needs tend to function optimally when shown the care and acceptance needed. In a similar manner Rohner et al. (2005), Rohner and Khaleque (2006) and Rohner et al. (2012) established an association between the acceptance/rejection of a child, socialisation and the learning outcomes of children. Parental acceptance, unlike rejection, highly contributed to a higher psychological adjustment, resilience and positive learning engagement (Dwairy, 2010; Mendo-Lázaro et al., 2019).

In line with past studies (Adigun & Nzima, 2021; Amitay & Gumpel, 2015; Kim, 2020; Zimmerman, 2000), this current study established a relationship between ASE and AR. Adigun and Nzima (2021) linked ASE to the persistence of deaf learning in a Biology lesson. However, variations (high or low) in ASE have been reported to influence deaf learners' resilience towards academic tasks and achievements (Adigun & Nzima, 2021; Traxler, 2000). Also, our finding on the relationship between CUSE and the AR of deaf learners during the lockdowns supports

previous research on the role of technology in learners' attention and the development of positive attitude towards the completion of learning tasks (Adigun, 2020; Adigun & Nzima, 2020; Bates & Khasawneh, 2007; Yenice, 2006; Zazove et al., 2004). Furthermore, our study found an inverse relationship between PI and the AR of deaf learners. While our study agrees with Olaseni (2020) and Tudor and Spray (2017) who posit that the state of learners' resilience towards academic activities is a function of the interaction between learners and their families, this current finding does not correspond to findings which reported positive or no relationships between PI and learners (Akellot & Bangirana, 2019; Calderon, 2000; Gizir & Aydin, 2009; Luckner & Velaski, 2004; Jackson & Turnbull, 2004). Our finding on an inverse relationship between PI and deaf learners' AR might be due to socio-economic challenges and associated psychological trauma faced by parents during the COVID-19 lockdowns.

In response to hypothesis 2, this study found a directly significant relationship between latent variables (PI, PAR, ASE, CUSE) and the AR of the deaf learners who participated in e-learning activities during the lockdowns. The findings further revealed that ASE has the highest contribution to deaf learners' AR towards online academic activities during the COVID-19 lockdowns. This was followed by CUSE and PAR. These results imply that good and moderate to high deaf learners' academic and computer user self-efficacies, as well as positive parental acceptance, will predict a high inclination of resilience for digital learners among the deaf during a challenging time such as the one presented by COVID-19. This current finding substantiates the results of past studies such as those by Adigun and Nzima (2021), Aktar et al. (2013), Bedrossian (2021), Compeau and Higgins (1995), Merdinger et al. (2005), Mwangi, et al. (2017), Rohner et al. (2005), Rohner (2004), Sun and Rueda (2012).

As indicated by Bedrossian (2021), Merdinger et al. (2005) and Mwangi et al. (2017), the resilience abilities of an individual, irrespective of gender or disabilities, are a function of their immediate environment. The assertions of Bedrossian (2021) and Mwangi et al. (2017) buttress the Bioecological Systems Theory (Bronfenbrenner, 1979; 2005). While learning engagement is conducted within the online learning environment, the immediate home environment of deaf learners during the COVID-19 lockdowns can have a potential influence on their resilience capabilities towards online learning engagements. The capacities of and supports (moral and technical) received by deaf learners to effectively use digital devices to access learning tasks can further assist in ensuring the completion of academic tasks. In other words, issues around how well deaf learners are accepted by parents/guardians and family members/siblings can define the type of academic support they receive. Such perceived support together with learners' ASE (Adigun & Nzima, 2021; Kim, 2020) and CUSE (Compeau & Higgins, 1995; Sun & Rueda, 2012) is said to directly influence their AR towards online learning activities.

Furthermore, our study found a significantly indirect relationship between the latent variables (PI; PAR; ASE; CUSE) and deaf learners' AR towards online learning during the lockdowns when examined through the onset of deafness but not gender. This finding implies that the onset of deafness (pre-lingual or post-lingual) interferes with academic tenacity among

the deaf. This may perhaps be due to variations and past experiences with languages. In other words, irrespective of gender differences, individuals with post-lingual deafness who had previous privileges with the use of oral-aural communication may further have a better understanding of the digital learning environment which includes texts, videos and animations, among others, than those with pre-lingual deafness (Adigun & Nzima, 2020). Irrespective of individual capabilities or environmental conditions, studies have shown that variations in language exposures influence the learning potentials of deaf students (Adigun, 2017; Lang, 2002; Marschark & Hauser, 2012; Ogundiran & Olaosun, 2013). In other words, individuals with post-lingual deafness will have a better understanding of vocabulary, its usage and applications than their counterparts who are pre-lingually deaf. Hence, learners with post-lingual deafness can have higher resilience towards academic activities and performances during face-to-face or e-learning activities when levels of past language ability are considered.

CONCLUSION

Findings of the study have further extended research ideas and understanding of the implications of parental involvement, parental acceptance/rejection, academic self-efficacy and computer user self-efficacy on academic resilience, particularly for online teaching and learning activities. This study concludes that academic and computer user self-efficacies are essential predictors of successful participation in e-learning. In other words, higher levels of academic and computer user self-efficacies can enhance resilience towards e-learning activities among deaf learners. Also, our study believes that parental involvement in the education, especially online learning activities, of deaf learners needs urgent attention.

The outcome of this study may further assist counselling psychologists, mental health professionals, parents/guardians, teachers and researchers in identifying and ascertaining definite guidelines for managing e-learning activities. Such guidelines should be geared towards enhancing the resilience capacities of deaf learners, especially during this challenging time of the pandemic with limited opportunities for face-to-face learning. It is very important for parents/guardians of deaf learners to show interest in the education of their children/wards and to assist them with computer applications/software which can make deaf learners participate seamlessly in e-learning activities. Interestingly, deaf learners will develop higher academic self-efficacy, computer user-self efficacy and improved resilience for e-learning when parents and guardians accept them (deaf learners) for who they are based on their language and cognitive abilities. Parental acceptance and active involvement in the education of deaf learners can improve their self-confidence for e-learning. The outcome of this study will further assist counselling psychologists and researchers to foster psychotherapeutic interventions to enhance resilience towards digital learning among deaf learners. Counselling psychologists must endeavour to promote social acceptance of the deaf while activities and programmes that will foster parent-deaf child bonding must be promoted by counselling psychologists and social workers.

Limitation of the study and suggestion for further research

According to Theofanidis and Fountouki (2018), no research endeavour is exempted from some form of limitation or another. Hence, this current study is not exempted from some limitations. For instance, this study used a closed-ended questionnaire for data collection. In other words, participants were not given the opportunities to express themselves beyond the confines of the authors. In addition, the opinions of parents/guardians were not accommodated in this study. It is apparent that variations in the variables examined in this study may have further implications on the academic resilience of deaf learners. Regrettably, this current study did not examine the influence of the dichotomised variables on the academic resilience of deaf learners. Hence, future studies should endeavour to bridge the research gaps observed of this current study.

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