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Psychological Factors as Determinants of Use and Adjustment to Assistive Technology by Students With Hearing Impairment in Tertiary Institutions in Oyo State, Nigeria

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Abstract

Students with hearing impairment find it difficult to use and adjust to assistive technologies due to some psychological factors. This in turn tends to have great influence on their academic performance and psycho-social interactions with people around them. Consequently, this study, therefore, investigated some psychological factors as determinants of the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions in Oyo State, Nigeria. Descriptive survey research design was adopted for the study, as purposive sampling technique was used to select the sixty respondents from two tertiary institutions in Oyo state. This study raised and answered three research questions tested at 0.05 level of significance. Multiple regression and Pearson's Product Moment Correlation (PPMC) were used as statistical methods of data analysis. The findings of this study revealed a significant relationship among the psychological factors: personality ($r=0.402$, $P<0.05$); self-esteem ($r=0.309$, $P<0.05$); and locus of control($r=0.800$, $P<0.05$) on the use and adjustment to assistive technologies by students with hearing impairment in tertiary institutions. The study also established joint influence of the independent variables on the dependent variables ($F=34.662$, $P<0.05$). The results yielded a coefficient of multiple regression which implies that the three independent variables jointly accounted for the use and adjustment to assistive technology by students with hearing impairment. Personality factor ($\beta=0.707$, $t=5.173$, $P<0.05$); self-esteem ($\beta=0.664$, $t=2.310$, $P<0.05$); and locus of control ($\beta=0.751$, $t=8.502$, $P<0.05$) had relative influence on the use and adjustment to assistive technology by students with hearing impairment. Assistive technologies are effective in boosting the performance of students with hearing impairment in tertiary institutions. Therefore, the psychological factors of students with hearing impairment should be enhanced before introducing assistive technology. Students should be taught how to develop the right attitude towards the use of assistive technologies.

Keywords: *Psychological factors, Locus of control, Assistive technology, Hearing impairment, Students with hearing impairment.*

Introduction

Communication difficulty, which is the major challenge of students with hearing impairment, has been observed having some adverse effect on the overall psychological well-being of these categories of students in tertiary institutions. This

observed problem, in addition to continuous use of Assistive Listening Devices (ALDs), which is meant to compensate for the difficulty in hearing, has been seen as impediments towards having smooth psycho-social adjustment, belonging to expected societies and associations, participation in some school extra-curricular activities, and in getting appropriate jobs or employment opportunities. Hence, students with hearing impairment in tertiary institutions appear having intrapersonal and interpersonal adjustment problems to the use of ALDs. This might be as a result of negative feelings, lack of acceptance by the society and lack of social identity owing to total breakdown of social status consequent upon the manifestation of hearing impairment, which often leads to perverse behaviour (Hallberg & Carlson, 1991; Garnefski, Grol & Hamming, 2009). In fact, students with hearing impairment in tertiary institution of learning often experience greater risk of social withdrawal due to frustrations in communicating with friends and family (Echalier, 2010). Most often, due to communication challenges and other attendant problems occasioned by hearing impairment, students with this condition have been observed having difficulty coping with both social and educational dictates of tertiary institutions. Students with hearing impairment present poor adjustment skill to the use of ALDs, therefore the devices have not been adopted and used as expected to ameliorate the difficulties as a result of the condition of their hearing impairment. Despite advances and efforts to improve the outcomes of students with hearing impairment in tertiary institutions through the use of assistive listening devices, evidence has shown that students with hearing impairment continue to lag behind their peers without hearing impairment in academic achievement. In line with that, it has been observed that students with hearing impairment encounter communication challenges in lectures and tutorials (Hyde, 2009; Schroedel, Watson & Ashmore, 2003; Spadbrow & Power, 2004).

The barriers that individuals with hearing impairment experience in their daily lives such as in education, employment, and in the community all have adverse effect on their mental health. Thus, when children have difficulty understanding others and expressing themselves, it is not surprising that psycho-social and emotional adjustment problems ensue (Cohen, 2010), because communication is the major challenge of people with hearing impairment. To this end, difficulty in relating information to others among persons with hearing impairment in this hearing world can cause psychological problems. Although, the experience of hearing difficulty differs from person to person, and differences could be observed in line with the time of onset, degree and nature of the difficulty. For instance, people who lose their hearing later in life are at greater risk of social withdrawal owing to frustrations in communicating with friends and family (Echalier, 2010). Without proper management and adequate rehabilitation cum appropriate selection of assistive listening technologies, the psycho-social and general well-being of people with hearing impairment will be greatly marred.

Assistive listening technologies (ALDs) are the institutionalised auditory rehabilitative mechanisms in audiological parlance to lessening the hearing challenges as well as the attendant psycho-social problems of people with hearing impairment. ALDs are known as auditory hearing devices meant to help students with communication problems enjoy interpersonal communication and reception of required information as well as messages, but surprisingly individuals with hearing impairment have complained of different problems

and challenges coping with these technologies. It has been observed that hearing impairment accelerates personality change, and that individuals who are less extroverted are more likely to become socially isolated (Berg, 1987; Cox, Johnson & Xu, 2014). While the young adults with hearing impairment can feel lonely and unhappy, especially if they are unable to spend time with their peers without hearing impairment. Also, individuals with hearing impairment are more likely to develop depression than those without hearing impairment (Saito, Nishiwaki, Michikawa, Kikuchi, Mizutari, Takebayashi & Ogawa, 2010). Thus, Matthews (2011) recommended the need for personalised hearing rehabilitation devices to support individuals with hearing difficulties. The hearing rehabilitation devices would help the individuals with hearing impairment adjust to their conditions even as they use the assistive listening technologies.

Consequent upon these communication problems, students with hearing impairment express different accommodations and adjustment difficulties which have led to inventing different types and categories of these assistive technologies to assist them. Despite advances and efforts to improve the outcomes of students with hearing impairments, evidence suggests that these students continue to lag behind their general education peers in academic achievement (Traxler, 2000; Antia, Jones, Reed, & Kreimeyer, 2009). Most times, students with hearing impairment on ALDs feel stigmatised, and often refuse to use these hearing devices, with a reason that the devices make them feel odd among their peers, and open them to embarrassment as well as personality changes. Going by the need of people with hearing impairment, ALDs are meant to help students with communication difficulty, but surprisingly nowadays, majority of the students with hearing impairment in tertiary institutions are having nostalgic experiences using the devices. They tend to develop adjustment problem to the use of ALDs, fear, and aggressiveness. Thus, they seem easily frustrated and impatient when using and adjusting to ALDs. Therefore, this makes them experience series of problems such as educational retardation, despair and barriers in their daily lives, which has serious implications on their mental health and psychological wellness as the difficulty in understanding others and expressing themselves might bring about psycho-social adjustment problems (Cohen, 2010). Also, this condition might lead to a state of having low self-esteem, feeling of being at a disadvantaged position, increased risk of developing emotional problems such as loneliness, rejection and social isolation (Owolawi & Eleweke, 2001).

Research indicates that the level of difficulty coping in a 'hearing' environment increases dramatically at post-school level. At university level, students with hearing impairment experience some forms of communication barriers within the learning environment which include poor classroom acoustics together with excessive levels of background noise (King, Delfabbro, Griffith, 2010), reverberant rooms, poor lighting conditions, staff/students unaccustomed to communicating with students with hearing impairment. Due to communication barriers, these students develop psychological problems such as frustration and isolation. They find it difficult using and adjusting to assistive technology owing to poor learning environment and this can result in low academic performance (Lartz, Stoner & Stout, 2008). Thiemann (2010) posited that having a solid foundation and competence in spoken language is paramount for the successful achievement of academic and social

competence. The physical structures of the tertiary schools are not acoustically suitable for the use of ALDs, and thus make the devices unfriendly to the wearers. The background noise in most tertiary institutions makes the listening devices to be too high and noisy for the wearers. Most times, the volume and frequency of the sounds generated (from different sound sources such as electrical appliances, generating sets, vehicles, interactive sounds of the students and the use of electronic gadgets) within the tertiary schools do affect the use of hearing devices. In another way, students with ALDs also find it difficult to adjust to the use of these hearing devices, in the sense that some of these devices make hearing difficult, by listening to or participating in a classroom or group discussions with a background noise (Powell, 2011). In fact, in an environment with unsympathetic acoustic control of noise, the wearers of hearing devices will not find the ALDs helpful, because the devices (being acoustic magnifiers) will pack up all sounds around, magnify all and send directly to the hearing systems of the individual who wears it, and this might narsate the person. The noise situation in majority of our tertiary institution of learning is worrisome, and capable of discouraging the users. Therefore wearing of hearing aids where the noise level is too high could be traumatic and intolerable.

In line with the above, Gagne, Southall and Jennings (2011) discovered that some individuals with hearing impairment refuse to wear hearing aids due to the unregulated environmental noise / noise pollution, stigmatisation, public embarrassment or shame, and feeling of being the odd one out of the crowd. It has also been observed that high or low self-esteem of persons with hearing impairment towards the use and adjustment to assistive technology can affect their adaptation to the use of the devices, most especially those of them in tertiary institutions. Similarly, Bell (2013) posited that students with hearing impairment display both positive and negative personal characteristics that can influence their ability to be successful at the university. Some of the positive personal characteristics include being self-motivated to pursue a university education, self-reliant, persistent, mature and responsible and having self-determination. In fact, some of the characteristics displayed could distract them from attaining successful educational outcomes. For instance, a student with hearing impairment and low self-esteem will have lower academic standard. Some students with hearing impairment that have low self-esteem refuse to disclose their identity so as to avoid labelling, sympathy and stigmatization (Bell, 2013). Students with hearing impairment need to have high self-esteem in order to benefit from the use of assistive technologies. Similarly, their locus of control which the individual's perceptions regarding self-control of one's behaviour or allowing external forces exert more influence on one's behaviour. Locus of control beliefs are related to achievement-oriented behaviour in the sense that emotional state has been shown to depend on locus of control (Jagacinski & Nicholls, 1984). Thus, Wang, Kick, Fraser and Burns (1999) suggested that locus of control is related in dimensions of control ideology, system blame and self-blame and noted that this construct affects educational and occupational outcome variables. To this end, assistive listening technologies have been observed having the potential to stimulate and foster problem-solving solution strategies and the internal locus of control of students with special needs. Using assistive listening devices, students with hearing impairment will be able to resolve most educational challenges experienced in school. Thus this study investigated the

relationship between the psychological factors and the use and adjustment to assistive listening technologies by students with hearing loss in tertiary institutions in Oyo state.

Purpose of the study

The aim of this study was to investigate how psychological factors influence the use and adjustment to assistive technologies by students with hearing impairment in tertiary institutions in Oyo state. The specific objectives drawn to guide this study include to:

1. examine relationship between the psychological factors (personality types, self-esteem and locus of control) and the use/adjustment to assistive technology by students with hearing impairment in tertiary institutions;
2. investigates the joint contribution of psychological factors (personality types, self-esteem and locus of control) on the use/adjustment to assistive technology by students with hearing impairment in tertiary institutions; and
3. examines the relative influence of each of the psychological factors (personality types, self-esteem and locus of control) on the use/adjustment to assistive technology by students with hearing impairment in tertiary institutions.

Research Questions

1. What relationship exists between psychological factors (personality types, self-esteem and locus of control) and the use/adjustment to assistive technology by students with hearing impairment?
2. What is the joint contribution of the psychological factors (personality types, self-esteem and locus of control) and the use/adjustment to assistive technology by students with hearing impairment?
3. What is the relative influence of each of the psychological factors (personality types, self-esteem and locus of control) on the use/adjustment to assistive technology by students with hearing impairment?

Research Design

The research work adopted a cross-sectional design using survey method. This research design enabled the researchers to obtain the opinion of the respondents without manipulating any of the variables involved.

Population

The target population for this study were all students with hearing impairment in tertiary institutions in Oyo state, Nigeria.

Sample and Sampling Techniques

The respondents in the study comprised sixty (60) students with hearing impairment from two selected tertiary institutions in Oyo state. These tertiary institutions have students with hearing impairment found to be appropriate to represent the entire population of few students with hearing impairment in tertiary institutions. Thus, thirteen (13) students were selected from University of Ibadan, while forty-seven (47) students were selected from Federal

College of Education (Special), Oyo. The respondents were selected through purposive sampling technique from each of the selected tertiary institutions, because of the peculiarity of the respondents, nature of their conditions and characteristics.

Instruments

The main instrument used for data collection was a structured questionnaire for the purpose of eliciting information directly from the respondents, who were students with hearing impairment from the two selected tertiary institutions. The instrument was a standardized scale with five (5) sections: Section A was used to elicit demographic information about the respondents; Sections B and C were used to obtain responses about the issues relating to their self- esteem and personality type respectively. Section D measured issues relating to locus of control, while Section E captured issues relating to Assistive Technology utilization and adjustment.

Section A: Demographic Information

The items in section A covered the respondents' gender, age, nature and degree of hearing impairment, level/year of study, parental educational and social status, and religious affiliation.

Section B: Rosenberg Self-esteem Scale

The Rosenberg Self-esteem Scale (RSES), a well-established, reliable, and valid measure of self-esteem, was used with 10 items about self-perception of worth (Rosenberg, 1965). The scale has five items with positively focused wordings; such as 'On the whole, I am satisfied with myself', and five negatively focused wording items; such as 'At times, I think I am no good at all'.

Respondents rated agreement with each statement on a 4-point Likert scale ranging from Strongly Disagree (score□=□1) to Strongly Agree (score□=□4) (Rosenberg, 1965). Negatively worded items were reversed, so higher scores indicated more positive self-esteem. The global self-esteem score represents the sum of scores for the 10 individual items, resulting in a possible global self-esteem rating ranging from 0 to 30. Scores between 15 and 25 represent the normal range for self-esteem. Scores exceeding 25 indicate high self-esteem, and scores less than 15 suggest low self-esteem (Rosenberg, 1965). Reliability of the RSES in adolescents extends across gender, race, ethnicity, and nationalities, with Cronbach's Alpha values ranging from .45 to .90 across countries and .88 for the United States (Dukes & Martinez, 1994; Schmitt & Allik, 2005). Dukes and Martinez (1994), who transformed RSES scores to a scale of 10 to 40, reported a grand mean of 30.75 (SD□=□5.06) for 18,612 junior high and high school students. This grand mean transforms to a mean score of 20.75 (SD□=□5.06) on a scale ranging from 0 to 30.

Section C: Personality Type

The instrument used for personality traits and constructs was a standardised instrument from the International Personality Item Pool (2001). Coefficient alphas for each dimension were provided by International Personality Item Pool (2001) as follows: extroversion (α=.87), agreeableness (α=.76), conscientiousness (α=.78), emotional stability (Neuroticism)

(α=.85), and openness to experience (α=.76). This shows that the instrument was highly reliable for the study. The items in each section were presented in a four-Likert scale ranging from 1-4. A respondent is expected to choose one in line with his/her personality from the list of the strongly agreed; agreed; disagreed or strongly disagreed.

Section D: Academic Locus of Control (ALOC) Scale

The ALOC Scale used for the study was developed by Trice in the year 1985. It was a 28-item scale designed to assess locus of control in an academic context. The scale was developed to tap into beliefs about personal control in academically relevant areas with respect to achievement motivation and academic performance. The reliability of this scale was reported by Rey, Knoblauch, Jouvent, Collet, and Dubal (2010) to be 0.79 and 0.68 respectively.

Section E: Assistive Technology Utilisation and Adjustment Scale

The Assistive Technology Utilisation and Adjustment scale used was an adapted form of a scale developed by Lin in the year 2005. The scale was reported having a reliability index 0.80. This scale consists of different questions aimed at measuring the use and adjustment to assistive technology as well as its effects on the academic performance. The scale contains twenty (20) items in which respondents are required to answer, based on a 4-point Likert scale of Strongly Agree (SA) (4), Agree (A) (3), Disagree (D) (2), Strongly Disagree (SD) (1). The reliability of this instrument was also reported by Conole, de Laat, Dillon and Darby (2008) as 0.75.

Validation of Instrument

The researchers ensured both the content and face validity of the instruments used. The instruments used were adapted from standardised scales that were found adequate to measure the variables under investigation.

Reliability of Instrument

The Big Five Factors' scale was adapted from the *International Personality Item Pool* (2001), however, changes were made on the construct to satisfy the purpose of this study and subject of interest. The modification also applied to all other instruments used in this study. In ensuring the reliability of the study, a pilot study was done with twenty questionnaires among different categories of students to ensure reliability of the items. The Cronbach Alpha was used for the reliability analysis, and high coefficient alpha of 0.79; 0.87; and 0.84 were established respectively.

Procedure for Data Collection

The questionnaires were administered to students with hearing impairment at the University of Ibadan and Federal College of Education (Special), Oyo state. The researchers personally distributed copies of the questionnaire to each of the respondents, differently in the two higher institutions sampled. Instructions were read and explained to the respondents where necessary to ensure proper understanding of the constructs of the questionnaire and total cooperation of the respondents. Thereafter, the researchers collected all the copies on the spot, so as to rule out contamination.

Method of Data Analysis

The data were analysed with the use of descriptive statistics, Pearson Product Moment Correlation and Multiple Regression.

Results

Research Question 1: What relationship exist between psychological factors (personality types, self-esteem and locus of control) and the use/adjustment to assistive technology by students with hearing impairment?

Table 1: Pearson Product Moment Correlation between psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology

Variables	$\bar{X}$	S.D	N	r	P	Remark
Use and adjustment	54.43	11.029	200	-	-	-
Personality type	75.26	7.852		.402**	0.001	Sig
Self-esteem	27.65	2.950		.309**	0.016	Sig
Locus of control	81.10	12.528		.800**	0.000	Sig

Correlation Significant at *P<0.05 level.

Table 1 shows that there was a significant relationship between the psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions. That is, use and adjustment to assistive technology has positive correlation with personality type (r=0.402, P<0.05), with self-esteem (r=0.309, P<0.05), and locus of control (r=0.800, P<0.05). It implies that there was a significant relationship between the psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions.

The finding of this study agrees with those of Lang, Biser, Mousely, Orlando and Porter, (2004); Lang, Stinson, Kavanagh, Lui and Basile, (1999); Cox, Alexander, and Gray, (2007), as well as Garstecki and Erler, (1998) that personality type of students with hearing impairment in tertiary institution affects their use and adjustment to assistive technology. Therefore, the personality of students with hearing impairment in tertiary institutions must be worked upon, so as to achieve continued use and positive adjustment to assistive technology as a means to enhance their academic performance.

Research Question 2: What is the joint contribution of the psychological factors (personality types, self-esteem and locus of control) and the use/adjustment to assistive technology by students with hearing impairment?

Table 2: Summary of Regression Analysis of the Combined Prediction of each of the Independent Variables on the Dependent Variable.

Source of Variation	Sum of Square	df	Mean Square	F	P	Remark
Regression	4664.661	2	1554.887	34.662	0.000	Sig
Residual	2512.072	57	44.858			
Total	7176.733	59				

Table 3 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.806	0.650	0.631	6.69764

Table 2 indicates that there was a significant joint contribution of the psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions. That is, use and adjustment to assistive technology jointly correlates positively with the personality, self-esteem and locus of control. The table also shows a coefficient of multiple correlations (R) of 0.806 and a multiple R square of 0.650. This means that 63.1% (Adj. R^2=0.631) of the variance in the use and adjustment to assistive technology is accounted for the independent variables, when considered jointly. The table also shows that the analysis of variance for the regression yielded a F-ratio of 34.662. This implies that the joint contribution of the independent variables to the dependent variables was significant and that other variables not included in this model may have accounted for the remaining variance. The model of summary contained in Table 3 shows that all the independent variables jointly explain the influence of psychological factors on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions at 65%. Also, the finding of this study on the joint contribution of the psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions corroborates the study of Brooks and Hallam, (1998), Cienkowski and Pimentel, (2001), Garstecki (1996), as well as Garstecki and Erler (1998) indicating that the psychological factors have influence on the use and adjustment to assistive technology by the students with hearing impairment. In fact, this present study has also confirmed a significant joint influence of psychological factors on the use and adjustment to assistive technology.

Research Question 3: What is the relative influence of each of the psychological factors (personality types, self-esteem and locus of control) on the use/adjustment to assistive technology by students with hearing impairment?

Table 4: Relative Influence of the Independent Variables on the Dependent Variables (Test of Significance of the Regression Coefficients)

Variables Model	Unstandardised Coefficients (B) (B)	Std. Error	Standardised Coefficients Beta	t	Sig.	Remark
Constant (use and adjustment to assistive technology)	12.817	10.293	-	-1.245	.218	-
Self-esteem	.996	.321	.664	2.310	.046	Sig
Personality type	.448	.340	.707	5.173	.025	Sig
Locus of control	.661	.777	.751	8.502	.000	Sig

Table 4 reveals the relative influence of the independent variables on the dependent variable, expressed as beta weights. Using the standardised regression coefficients to determine the relative contribution of the independent variables. Locus of control ($\beta = 0.751$, $t = 8.502$, $p < 0.05$) is the most potent contributor to the prediction, followed by personality type ($\beta = 0.707$, $t = 5.173$, $p < 0.05$), and self- esteem ($\beta = 0.664$, $t = 2.310$, $p < 0.05$), in that order. It implies that there was a relative influence of each of the psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions.

The findings of this study on the relative influence of each of the psychological factors (personality type, self-esteem and locus of control) on the use and adjustment to assistive technology by students with hearing impairment in tertiary institutions is in consonance with the claims of Humes, Wilson, and Humes, (2003), Kricos, Erdman, Bratt, and Williams, (2007), and Lockey, Jennings, and Shaw, (2010). Their findings consistently revealed that psychological factors such as personality, self-esteem and locus of control can influence the use of assistive technology by students with hearing impairment as well as influencing their level of adjustment to the use of the assistive technology.

Conclusion

The psychological factors of students with hearing impairment are important when considering the use and adjustment to assistive technologies. There was a significant relationship between personality types of the students with hearing impairment in tertiary institutions and adjustment to the use of assistive technologies. Also, there was a significant relationship between the self-esteem and adjustment to the use of assistive technologies, as

well as there was a significant relationship between locus of control of the respondents and adjustment to the use of assistive technologies. The personality of students with hearing impairment in the tertiary institutions sampled can determine their use and adjustment to the use of assistive technologies. In the same vein, the respondents' self-esteem and locus of control were also found having some level of influence on the utilisation of assistive technologies.

Recommendations

The following recommendations are made based on the findings of this study.

1. Students with hearing impairment should be encouraged to develop high self-esteem, positive personality type, and right attitude towards the use of assistive technology (AT).
2. School administrators and teachers should encourage and assist these categories of students in building healthy self-esteem towards the use of AT. This could be done through regular counselling and motivational seminars.
3. Auditory training and speech therapy programmes should be organised for students on AT, because these therapeutic services will help them to make maximal use of the listening devices.
4. School administrators and teachers should endeavour to develop in these students or encourage them towards acquisition of personality factors that may influence the use and adjustment to AT.
5. Students with hearing impairment in tertiary institutions must be counselled appropriately towards the use and adjustment to assistive technology. Their level of psycho-social and educational adjustment must be evaluated constantly so as to determine and review the nature of rehabilitation to be given to them per time.
6. School administrators should ensure the availability of appropriate facilities and materials, and conducive environment that is free of noise and distractions, because these will facilitate smooth learning. Also, they should endeavour to make available lecture rooms that must be well illuminated so that these students can see both the face and hands of the lecturers and sign language interpreters clearly, as this would facilitate learning and proper adjustment.
7. Lecturers should make use of amplifications (such as microphones) so as to help the students using assistive technology to benefit maximally from the classroom interaction.
8. Lecturers should avoid using or appearing in a manner that will discourage learning. At all times, the interest of these categories of students should be paramount in their heart. In addition, they must see to the general well-being of these students.

References

Antia, S. D., Jones P. B., Reed, S. and Kreimeyer K. H. (2009). Academic status and progress of deaf and hard-of-hearing students in general education classrooms. *Journal of Deaf Studies and Deaf Education*, 14 (3), 293–311. doi:10.1093/deafed/enp009.

Bell, D. (2013). Investigating teaching and learning support for students with hearing impairment at a university. Western cape. Stellenbosch university.

Berg, F. (1987). Facilitating Classroom Listening: A handbook for teachers & normal hearing and hard-of hearing students. Arstin, TX: Pro-Ed.

Branden, N. (2001). *The psychology of self-esteem: A revolutionary approach to self-understanding that launched a new era in modern psychology*. San-Francisco: Jossey Buss.

Brooks D. Hallam R. (1998). Attitudes to hearing difficulty and hearing aids and the outcome of audiological rehabilitation. *British Journal of Audiology,* 32(4)217.

Cohen, N.J. (2010). Language development and literacy: the impact of language development on the psychosocial and emotional development of young children. Canada: Hincks-dellcrest centre.

Cienkowski K, and Pimentel V. (2001). The hearing aid "effect" revisited in young adults *British Journal of Audiology,* 35. 289–295.

Dukes R. L., and Martinez R. (1994). The impact of the gender on self-esteem among adolescents. *Adolescence,* 29: 105–115.

Conole, G., de Laat, M., Dillon, T. and Darby J. (2006). Joint information services committee (JISC) LXP, student experiences of technologies, final report, JISC, Bristol. Retrieved from http://labspace.open.ac.uk/file.php/1/kmap/1176712833/references/LXP%20project%20 final%20report%20dec%2006.pdf.

Cox, R. M. and Alexander, G. C. (2002). The International Outcome Inventory for Hearing Aids IOI-HA): Psychometric properties of the English version. *International Journal of Audiology*. 41. 30–35.

_____, R. M., Alexander, G. C. and Gray, G. A. (2005). Who wants a hearing aid? Personality profiles of hearing aid seekers. *Ear and Hearing,* 26. 12–26.

_____, R.M., Alexander, G.C. and Gray, G.A. (2007). Personality hearing problems and amplification characteristic contributions to self-report hearing aid outcome. Ear and Hearing, 28(27 141-162.

_____, R. M., Johnson, J.A. and Xu, J. (2014). Impact of Advanced hearing and technology on speech understanding for older listeners with mold to moderate adult0on set sensorineural hearing loss. Gerinotology. 60 (47), 557-568, doi:10.1159/000362547.

Dillon, H. (2001). *Hearing aids*. Sydney, Australia: Boomerang Press.

Echalier, M. (2010). In it together: the impact of hearing loss on personal relationships. RNID.

Gagne, J.P., Southall, K. and Jennings, M.B. (2011), Stima and self-stigma associated with acquired hearing loss in adults. Hearing Review, 18 (18) 16-22.

Garnefski N., Grol, M. and Hamming, J. (2009). Cognitive emotion regulation strategies and psycosocial adjustment in adolescents with chronic disease. Journal of

Adolescence. 32: 449-454.

Garstecki, D., (1996). Older adults: Hearing handicap and hearing aid management *American Journal of Audiology,* 5.3:25–34.

_____, D. and Erler S. (1998). Hearing loss, control, and demographic factors influencing hearing aid use among older adults. *Journal of Speech, Language, and Hearing Research,* 41. 527–537.

Getzel, E.E. and Thoma, C.A. (2008). Experiences of college students with disabilities and the importance of self-determination in higher education settings. *Career Development for Exceptional Individuals,* 31.2: 77–84.

Hallberg, L.R. and Carlsson, S.G. (1991), Hearing impairment, coping and perceived hearing handicap in middle-aged subjects with acquired hearing loss. British Journal of Audiology, 25: 323-339.

Helvik, A., Jacobsen G. and Hallberg L. (2006). Psychological well-being of adults with acquired hearing impairment. *Disability and Rehabilitation,* 28. 535–545.

Humes L., Wilson, D. and Humes, A. (2003). Examination of differences between successful and unsuccessful elderly hearing aid candidates matched for age, hearing loss and gender International *Journal of Audiology* 42. 432–441.

Jagacinski, C.M. and Nicholls, J.G. (1987). Competence and affect in task involvement and ego involvement: The impact of social comparison information. Journal of Educational Psychology, 79(2), 107-114.

Hyde, M.B. (2009). Inclusion in an international context. In D. F. Moores & M. S. Miller (Eds.), *Deaf people around the world: Educational and social perspectives* (pp. 352-367). Washington, DC: Gallaudet University Press.

King, D.L., Del Fabbro, S. and Griffith, M.D. (2010)l Cognitive Behavioural Therapy for Problematic Video Game Players. Conceptual considerations and practice issues. Journal of Cybertherapy and rehabilitation 3(3): 261-266.

Kricos, P., Erdman, S., Bratt, G. and Williams, D. (2007). Psychosocial correlates of hearing aid adjustment. Journal of the American Academy of Audiology 18. 304–322. doi:10.3766/jaaa.18.4.5.

Lang, H. G., Biser, E., Mousley, K., Orlando, R. and Porter, J. (2004). Tutoring deaf students in higher education: A comparison of baccalaureate and subbaccalaureate student perceptions. *Journal of Deaf Studies and Deaf Education*. 9.2: 189-201.

Lang, H. G., Stinson, M. S., Kavanagh, F., Liu, Y. and Basile, M. L. (1999). Learning styles of deaf college students and instructors' teaching emphases. *Journal of Deaf Studies and Deaf Education,* 4. 16-27.

Lartz, M.N., Stoner, J.B. and Stout, L. (2008). Perspectives of assistive technology from deaf students at a hearing university. *Assistive Technology Outcomes and Benefits*. 5.1. 72-91.

Lin, L. J. C. (2005). Development of a questionnaire for determining the factors in technology integration among teachers. *Journal of Instructional Psychology*, 32.4: 287-292.

Lockey, K., Jennings, M.B. and Shaw, L. (2010). Exploring hearing aid use in older women through narratives. Int. Journal of Audiology.

Matthews, L. (2011). *Seen but not heard: people with hearing loss are not receiving the support they need.* London: RNID.

Owolawi, W.O. and Eleweke C.J. (2011). The role of communication scientists (Audiologists) in effective health care delivery system. Journal of Special Education 9 (1): 188-207.

Powell, D. (2011). *Deaf Students Experiences of Tertiary Education* . Griffith University.

Rey, G., Knoblauch, K., Jouvent, R., Collet, L. and Dubal, S. (2010). The experience of pleasure before after hearing rehabilitation. Int. Journal Rehabilitation Research, 33(2): 158-164. doi: 10.1097/MRR.Oboize 328 331 C5C8.

Rosenberg M. (1965). *Society and the adolescent self-image*, Princeton, NJ: Princeton University Press.

Saito, H., Nishiwaki, Y., Michikawa, T., Kikuchi, Y., Mizutari, K., Takebayashi, T. and Ogawa, K. (2010). Hearing handicap predicts the development of depressive symptoms after three years in older community-dwelling Japanese. In *Journal of the American Geriatrics Society,* 58.1: 93-97.

Schmitt D. P. and Allik J. (2005). Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: Exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology,* 89: 623–642.

Schroedel, J. G., Watson, D., and Ashmore, D. H. (2003). A national research agenda for the postsecondary education of deaf and hard of hearing students. *American Annals of the Deaf,* 148.2: 67-73.

Spradbrow, G. and Power, D. (2004). Slipping through the cracks? The support needs of hard of hearing students in a university program. In D. Power and G. Leigh. (Eds.) Washington, DC: Gallaudet University Press. 206-212.

Theunissen, S.C., Rieffe, C., Netten, A.P., Briaire, J.J., Soede, W., Kouwenberg, M. and Frijns, J.H. M. (2014). Self-esteem in hearing-impaired children: The influence of communication, education, and audiological characteristics. PLoS One 9: e94521.

Taylor, S. and Todd, P. A. (1995a). Assessing IT Usage: The Role of Prior Experience. *MIS Quarterly*, 19.2: 561–570.

Thiemann, K. (2010). *Language Development and Literacy: Programs Supporting Young Children's Language Development.* University of Kansas, USA.

Traxler, C.B. (2000). The Standford Achievement Test. 9th Edition National Norming and Performance Standards for he deaf and hard-of hearing students. Journal of Deaf studies and Deaf Education. 5(4): 337-348.

Wang, L., Kick, E.L., Fraser, J. and Burns, T.J. (1999). Status attainment in America: The roles of locus of control and self=esteem in educational and occupational outcomes. Sociological Spectrum. 19(3) 281-298.