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Dyslexia: Impact of mobile phones educational programs on academic achievement of elementary school dyslectic students of India and Sudan

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Abstract---Although mobile phones have emerged in large numbers in the past few decades, little is known about their impact. Especially the impact on the attitude and academic performance of DYSLECTIC students. Although people are becoming more and more interested in mobile devices and their relevance and consequences on children, the impact of related studies varies, and the overall effect remains unclear. The purpose of this study is to further investigate any differences that may exist: based on gender and school type; on the impact of mobile phone educational programmes on academic achievement of elementary school dyslectic students of India and Sudan.

Keywords---impact mobile phones, mobile phones educational programmes, academic achievement, dyslectic students, Dyslexia.

Introduction

Dyslexia is the 'difficulty to read' despite normal intelligence. Different people are affected to different degrees. Problems may include spelling words, fast reading, writing words, "voicing" words in your head, unclear pronunciation when reading aloud, and difficulty in understanding what you are reading. These difficulties are usually first noticed in school. When someone who could read before loses the ability later is called "hypoxia." Difficulties are involuntary, and people with this disease have a normal desire to learn. People with dyslexia have a higher incidence of attention deficit hyperactivity disorder (ADHD), developmental language impairment, and digital impairment.

Dyslexia is thought to be caused by the interaction of genetic and environmental factors. Some cases are family-related. Dyslexia developed due to traumatic brain injury, stroke, or dementia is called 'acquired dyslexia'. The underlying mechanism of dyslexia is a problem in the brain's language processing. Dyslexia can be diagnosed through a series of memory, vision, spelling, and reading ability tests. Dyslexia is separate from dyslexia caused by hearing or vision problems or insufficient teaching or learning opportunities.

Treatment involves adjusting teaching methods to meet the needs of the patient. Although it does not solve the underlying problem, it may reduce the severity or impact of symptoms. Treatment for vision is ineffective. Dyslexia is the most common learning disability, and it occurs all over the world. It affects 3–7% of the population, but up to 20% of the total population may have some degree of symptoms. Although dyslexia is more common in men, it has been shown to affect both men and women the same. Some people think that dyslexia is best viewed as a different way of learning, with both advantages and disadvantages.

Recent research estimates that a staggering 15% of the world's population may have dyslexia [1]. Dyslexia is the most common learning disability that affects one's ability to read and write. Individuals with dyslexia typically read at levels significantly lower than expected, despite having normal or average intelligence scores. Although the disorder varies from person to person, some common characteristics among people with dyslexia are, difficulties with phonological processing (the manipulation of sounds), spelling, and/or rapid visual-verbal responding [2].

Dyslexia is a life-long condition and its symptoms might vary at different stages in a person's life, but timely and appropriate intervention can deliver significant results. Many intervention methods are currently in use, and more studies need to be done to determine which interventions work best. Research is now focusing among others and on the potential benefits of employing Information and Communication Technology (ICT) to develop interactive experiences and optimistic learning surroundings, that can motivate and help children, thus helping them address their disability early on and possibly mitigate its various negative effects.

Digital technologies can be used in order to train, assist and even enable the learning process. Specifically designed applications can stimulate students

interest, but may also help students with disabilities fit into and progress within mainstream school environments [3]. Thomas regarded ICT as an enabler, as it can facilitate access to students by learning, increasing their motivation, fostering self-competition, enhancing their confidence and self-esteem [4]. Various implementations of ICT in education and learning, have been researched, such as the use of websites as educational motivators for adults with learning disabilities [5], virtual environments [6], [7] and computer games [8][9], implementations of portable writing aids and configurable word processing environments to support people with writing difficulties [10], [11].

One of the main groups of people with special educational needs, such as dyslexia, could potentially gain many benefits from ICT [3], [12]. Keates [13] explained the need of dyslexic pupils to access ICT for learning and being introduced to the appropriate ICT, including hardware and software (such as different word processors) for these pupils. The use of multimedia is also believed to assist dyslexic learners [14].

Multimedia applications do not only allow, but also reinforce the bimodal presentation of information via visual and auditory channels; thus, information processing is accelerated and mnemonic recall is facilitated [8]. However, much less research has been conducted in the emerging field of mobile learning (m-learning). The adoption of mobile phones in the last decade has been explosive, but the potential of using these devices to transform teaching and learning has not yet been fully explored. M-learning is considered to be intersecting with mobile computing and e-learning technologies; it combines individualized learning with anytime and anywhere learning [15], [16]. Mobile learning provides an educational experience which is altering the nature of knowledge (formal and informal) and is focusing on the user's experience of learning through mobile devices. It provides a

wide range of educational and learning material in a uniquely engaging manner (touch-screens), whilst giving them the option to choose from information which will enrich their knowledge and improve their skills. Educational applications for mobile devices motivate the children and engage their attention while focusing on solving problems, improving their memory, their reading and writing skills. In addition to the traditional classroom contexts, the use of advanced technology in the learning process and its assessment through the m-learning tests enables the learner to develop the time of use according to his/her needs, by personalizing their experience.

M-learning seems to be favored by students, as it can potentially accommodate a wide range of features and sections which offer a highly interactive learning experience. It provides a stress free environment that is enhanced by specially designed user friendly interface. The design and text layout can eliminate the frustration and confusion, while making the information a much easier source to take in.

Peter Mulligan a Disability Advisor at Sunderland College, advises learners with dyslexia to use their mobile phones to make learning an easier and more pleasant process [17]. In fact, mobile applications encourage children with

dyslexia to carry out a larger number of exercises, and as for the children's interaction and learning through 220 Roxani Skiada et al. / Procedia Computer Science 27 (2014) 218 – 228 technology, it can progressively improve their mind mapping abilities. Saleh & Alias developed a mobile learning comic application for dyslexic children, which provided evidence for the potential of m-learning in such an environment [18]. Rello, Bayari & Gorriz developed "Dyseggia", a game application with word exercises for children with dyslexia which received positive feedback [19].

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Digital technologies can be used in order to train, assist and even enable the learning process. Specifically designed applications can stimulate students interest, but may also help students with disabilities fit into and progress within mainstream school environments [3]. Thomas regarded ICT as an enabler, as it can facilitate access to students by learning, increasing their motivation, fostering self-competition, enhancing their confidence and self-esteem [4]. Various implementations of ICT in education and learning, have been researched, such as the use of websites as educational motivators for adults with learning disabilities [5], virtual environments [6], [7] and computer games [8][9], implementations of portable writing aids and configurable word processing environments to support people with writing difficulties [10], [11]. One of the main groups of people with special educational needs, such as dyslexia, could potentially gain many benefits from ICT [3], [12]. Keates [13] explained the need of dyslexic pupils to access ICT for learning and being introduced to the appropriate ICT, including hardware and software (such as different word processors) for these pupils. The use of multimedia is also believed to assist dyslexic learners [14].

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Educational applications for mobile devices motivate the children and engage their attention while focusing on solving problems, improving their memory, their reading and writing skills. In addition to the traditional classroom contexts, the use of advanced technology in the learning process and its assessment through the m-learning tests enables the learner to develop the time of use according to his/her needs, by personalizing their experience.

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Mobile phones and its use by students

The emergence and popularization of mobile phones us here and era of the communication revolution. The result of this revolution is that almost every student you meet will have a mobile phone. Students use mobile phones in universities, high schools, middle schools, and even elementary schools. Children under the age of 10 also receives mobile gifts. Parents give their children mobile phones to protect them from daily risks involving personal safety.

This widespread ownership of mobile phones requires school administrators, teachers, students, and parents to adopt certain guidelines to ensure that potential problems involving mobile phones are clearly identified. This will help ensure that our students continue to enjoy the benefits of mobile phones (such as increased security). Today, more than one in six people worldwide use mobile

phones, digital cameras, personal digital assistants (PDAs) and wireless fidelity (Wi-Fi). Students can easily communicate with the world outside the classroom and have endless opportunities to participate in almost endless entertainment and distraction activities. For some educational philosophers, students must be in a controlled environment to be successful in study. Mobile phones have been identified as the source of crime, or distraction. Initially, school authorities banned the use of pagers and cell phones in school buildings to prevent them from being used for drug trafficking or to prevent them from misleading gangs.

Research GAP

From the global and local aspect many researches related to DYSLEXIA has been done but a research gap still exists as because literature review shows that no studies has so far been done to find out the significant difference in the attitude and academic achievement of the DYSLECTIC students based on gender (male and female); school types (government and private); before and after the conduction of educational programme using mobile phones.

A research gap has also been noticed related to the location of the study as because no studies has so far been done to access the impact of mobile phones on academic achievement of the elementary DYSLECTIC students of India and Sudan. Hence a sincere attempt has been made by the researcher to fill the gap in these areas related to DYSLEXIA.

Objectives of the study

1. To find out the significant difference in the attitude of DYSLECTIC students based on gender (male and female) after (post-test) the conduction of educational program using mobile phones.
2. To find out the significant difference in the academic achievement of DYSLECTIC students based on gender (male and female) after (post-test) the conduction of educational program using mobile phones.
3. To find out the significant difference in the attitude of DYSLECTIC students based on school types (government and private) after (post-test) the conduction of educational program using mobile phones.
4. To find out the significant difference in the academic achievement of DYSLECTIC students based on school types (government and private) after (post-test) the conduction of educational program using mobile phones.

Hypotheses

1. There is no significant difference in the attitude of DYSLECTIC students based on gender (male and female) after (post-test) the conduction of educational program using mobile phones.
2. There is no significant difference in the academic achievement of DYSLECTIC students based on gender (male and female) after (post-test) the conduction of educational program using mobile phones.
3. There is no significant difference in the attitude of DYSLECTIC students based on school types (government and private) after (post-test) the conduction of educational program using mobile phones.

4. There is no significant difference in the academic achievement of DYSLECTIC students based on school types (government and private) after (post-test) the conduction of educational program using mobile phones.

Delimitations

1. The study was limited to DYSLECTIC students only.
2. The study was limited to elementary students only.
3. The study was limited to attitude and achievement of the students only.
4. The study was limited to science subject only.
5. The study was limited to schools of INDIA AND SUDAN only.
6. The study was limited to six schools viz. 3 government and 3 private schools only.
7. The study was limited to 300 samples viz. 50 students of each school only.

Review of related literature

In 2018, about 77% of American residents owned a smartphone (Pew Research Center, 2018), which is defined here as a mobile phone that performs many functions of a computer (Alosaimi, Alyahya, Alshahwan, Al Mahiyari, and Shaik, 2016). In addition, a survey conducted in 2015 showed that 46% of Americans reported that they would not be able to survive without a smartphone (Smith, 2015). Similar figures can be observed in other parts of the (Western) world (OECD, 2017). Therefore, it is not surprising that in recent years discussions about the (potential) consequences of the (large) use of smartphones have won an important place in the social debate (see, for example, Eliahu, 2014; OECD, 2017). At the same time, scientists in different fields are becoming more and more interested in the use of smart phones. Researchers have studied the correlation between smartphone use and smartphone addiction, for e.g. (a) driving performance (Choudhary & Velaga, 2019); (b) sleep quality and quantity (Demirci, Akgönül, 2015); (c) Substance addiction (Ho et al., 2014); (d) Attention deficit and hyperactivity disorder (Ho et al., 2014).

In addition to (possibly) affecting people's private lives, the use of smartphones may also interfere with personal, education, and professional life. In particular, this is related to the academic performance of students. Among 18-29-year-olds, smartphone ownership is the highest (Pew Research Center, 2018), and students in this age group are highly representative. In addition, there are many theoretical reasons that can be expected that the (large) use of smartphones will have a direct impact on academic performance.

Research design In this study, a pre-experimental research design has been used. In this study, a set of pre-test-post-test research designs was used.

Method In this study, descriptive or normative surveys were used. In this study, a questionnaire survey was used.

Population In the present study all the elementary school students of INDIA AND SUDAN was considered as population.

Sampling techniques Systematic sampling or purposive sampling was done to select 6 elementary schools of INDIA AND SUDAN.

Stratified random sampling was done to select two strata i.e government and private schools. After selection of the strata; Random sampling technique was done to select 150 samples from each strata i.e (150 government school students + 150 private school students). Thus it can be said that random sampling technique was used in the present study to select the 300 actual sample. After collection of the actual sample two categorizations are done:

Tools used

- i. Attitude Scale
- ii. Achievement Scale/ Proficiency test

Analysis

Table 1. showing significant difference in the attitude of DYSLECTIC students based on gender(male and female) after (post-test) the conduction of educational programme using mobile phones

Groups (VARIABLES)	Sample	Mean	t-value
Male	180	80.57	0.58
Female	120	79.65	

*Not significant .05level

1.FIG. PIE showing significant difference in the attitude of DYSLECTIC students based on gender(male and female) after (post-test) the conduction of educational programme using mobile phones.

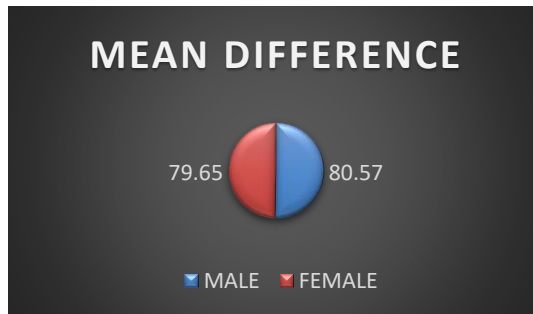


Table 2. showing significant difference in the academic achievement of DYSLECTIC students based on gender(male and female) after (post-test) the conduction of educational programme using mobile phones

Groups (VARIABLES)	Sample	Mean	t-value
Male	180	10.73	0.1576
Female	120	10.65	

2.FIG. PIE diagram showing significant difference in the academic achievement of DYSLECTIC students based on gender(male and female) after (post-test) the conduction of educational programme using mobile phones.

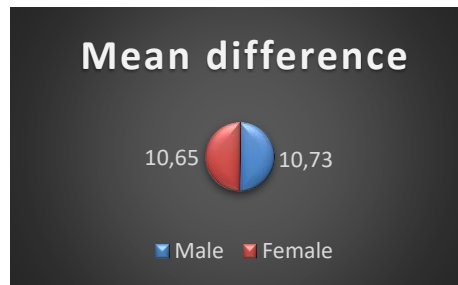


Table 3. significant difference in the attitude of DYSLECTIC students based on school types(government and private) after (post-test) the conduction of educational programme using mobile phones

Groups (VARIABLES)	Sample	Mean	t-value
GOVERNMENT	150	79.65	-0.18
PRIVATE	150	80.34	

*Not significant .05level

3.FIG. PIE diagram significant difference in the attitude of DYSLECTIC students based on school types(government and private) after (post-test) the conduction of educational programme using mobile phones.

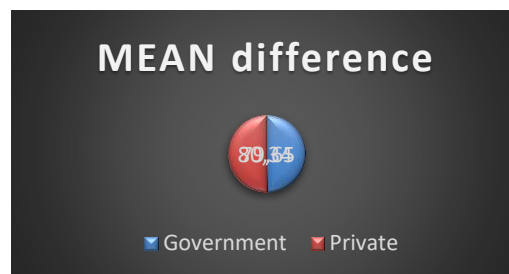
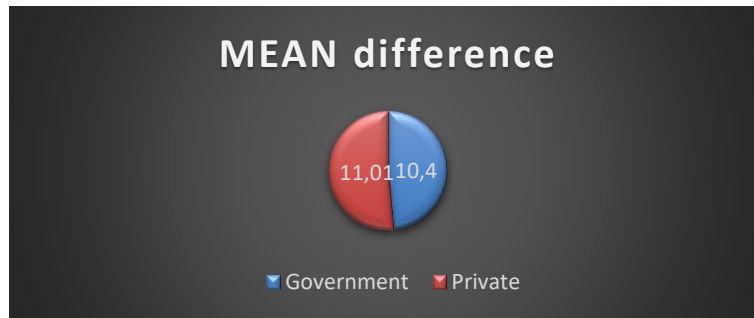


Table 4. Showing significant difference in the academic achievement of DYSLECTIC students based on school types(government and private) after (post-test) the conduction of educational programme using mobile phones

Groups (VARIABLES)	Sample	Mean	t-value
Government	150	10.4	-1.112
Private	150	11.01	

*Not significant .05level

4.FIG. PIE diagram Showing significant difference in the academic achievement of DYSLECTIC students based on school types(government and private) after (post-test) the conduction of educational programme using mobile phones.



Findings

1.After analysis of *Hypothesis 1*.

- it was found that the mean of male 80.57 is very slightly higher than the mean of female 79.65.
- it was found that the t-value is 0.58.
- Thus the result is not significant at .05 level.

2. After testing of the *Hypothesis 2*.

- it was found mean of male is very slightly higher 10.73 than the mean of female 10.65.
- it was found that the t-value is 0.1576.
- Thus the result is not significant at .05 level.

3. After testing of the *Hypothesis 3*.

- it was found that the mean of private elementary school dyslectic student mean is very slightly higher 80.34 than the government elementary school student mean 79.65.
- it was found that the t-value is -0.18.
- Thus the result is not significant at .05 level.

4. After testing of the *Hypothesis 4*.

- it was found that the mean of achievement among Private elementary dyslectic school students 11.01 is very slightly higher than the Government elementary school students 10.4.
- it was found that the t-value is -1.112.
- Thus the result is not significant at .05 level.

Conclusion

From *Hypothesis 1*. It can be concluded that there is no significant difference in the attitude of DYSLECTIC students based on gender(male and female) after (post-test) the conduction of educational programme using mobile phones. From *Hypothesis 2*. It can be concluded that there is no significant difference in the academic achievement of DYSLECTIC students based on gender(male and female) after (post-test) the conduction of educational programme using mobile phones. From *Hypothesis 3*. It can be concluded that there is no significant difference in the attitude of DYSLECTIC students based on school types(government and private) after (post-test) the conduction of educational programme using mobile phones. From *Hypothesis 4*. It can be concluded that there is no significant difference in the academic achievement of DYSLECTIC students based on school types(government and private) after (post-test) the conduction of educational programme using mobile phones.

References

1. "Dyslexia Information Page". National Institute of Nervous System Diseases and Stroke. November 2, 2018.
2. "How to diagnose dyslexia?". National Institutes of Health. (The original content was archived on April 2, 2015. Retrieved on March 15, 2015).
3. "What are the symptoms of dyslexia?". National Institutes of Health. December 1, 2016.
4. "What is dyslexia?". National Institutes of Health. December 1, 2016.
5. Becker (G.S. Becker). Time allocation theory. "Journal of Economics", 75 (1965), pp. 493-517.
6. E. Li Wen. The use and texting of Facebook by African American and Hispanic adolescents: Impact on academic performance. Journal of Black Studies, 45 (2014), pp. 83-101
7. E. Li Wen. Too much information: Young African Americans use smartphones and Facebook heavily. Journal of African Studies, 46 (2015), pages 44-61
8. <http://www.jmest.org/wp-content/uploads/JMESTN42350601.pdf>
9. <https://targetstudy.com/articles/mobile-phones-and-students.html>
10. <https://www.sciencedirect.com/science/article/abs/pii/S0360131518302161>
11. <https://www.sciencedirect.com/science/article/pii/S0883035520303487>
12. J.A. Boase, R. Ling. Measuring mobile phone usage: self-reporting and log data. Journal of Computer Mediated Communication, 18 (2013), pages 508-519
13. Khatoon, Khursheeda, A Comparative Study on Attitude towards English Language Learning among Students of Higher Secondary Level of Hyderabad (August 10, 2020). 10.5373/Jardcs, Volume 12, issue 5, 2020 , DOI: 10.5373/JARDCS/V12I5/20201975 Available at <https://www.jardcs.org/abstract.php?id=5353> <https://ssrn.com/abstract=3670979>
14. Khatoon. Khursheeda, Education And The Corona Pandemic: Lessons Learned Exploring Teaching And Learning Needs After The Corona Pandemic: Curriculum And Teaching Methods: Turkish Journal of Computer and Mathematics Education, Vol.12No.4 (2021), 1041-1043,

- <https://doi.org/10.17762/turcomat.v12i4.596>
15. Kooij, J.J. Sandra (2013). Adult ADHD diagnostic evaluation and treatment (3rd edition). London: Springer. p. 83. ISBN 9781447141389. Archived from the original on April 30, 2016.
 16. L.P. Beland, R. Murphy. III Communication: Technology, distraction and student performance. *Labor Economics*, 2016 (41): 61-76.
 17. Peterson (Robin L.) Pennington, Bruce F. (May 2012). "Developmental Dyslexia". *Lancet*. 379(9830): 1997-2007. doi: 10.1016 / S0140-6736 (12) 60198-6. PMC3465717. PMID22513218.
 18. R.K.B. Asante (R.A.) Shiaz's speech on the use of smartphones and academic performance: Reflections on Sustainable Development Goal 4. *Ghana Journal of Social Sciences*, 15 (2018), pp.161-178
 19. R.S. Chen Changhuiji. Research the relationship between thinking style and personal electronic device use and its impact on academic performance. "Computers in Human Behavior", 52 (2015), pages 177-183
 20. Siegel LS (November 2006). "Views on Dyslexia" *Pediatrics and child health*. 11(9): 581-7. doi: 10.1093 / pch / 11.9.581. PMC2528651. PMID19030329.
 21. Widana, I.K., Sumetri, N.W., Sutapa, I.K., Suryasa, W. (2021). Anthropometric measures for better cardiovascular and musculoskeletal health. *Computer Applications in Engineering Education*, 29(3), 550-561. <https://doi.org/10.1002/cae.22202>
 22. Wulansari, M., Sinrang, A. W., Syarif, S., Ahmad, M., Bahar, B., & Maddepungeng, M. (2021). The effectiveness of android-based education media of growth and development care towards mother's knowledge improvement . *International Journal of Health & Medical Sciences*, 4(2), 238-245. <https://doi.org/10.31295/ijhms.v4n2.1715>