

Final Assignment 2

Research Proposal:

Dyslexic Students and the Possible Developments of Dyslexic Users'  
Friendly Information and Communication Technology (ICT) Tools

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## Introduction and Background

Dyslexia is one of the very common learning disorders around the world. It is a frequent disorder among any given population but more noticeable among school age children. The impact of dyslexia in societies across the globe is a serious issue with higher incidences of dyslexia within the prison and probation populations, higher incidences of school drop out, higher incidences of long term unemployment. Other consequences of dyslexia include increased risk of psychiatric disorders like emotional and affective disorders, and conduct disorders (NeuroDys, 2008).

School age children with dyslexia face numerous challenges in their lives including learning, socializing, and even playing or doing group activities. However, there is a glimpse of hope. Recent researches involving dyslexia conclude with predictions that newly developed technologies would play a greater role in improving dyslexic students' livelihood, especially those who grow up using computers. Especially those known to us as *digital natives* who used or familiar with internet and mobile phones since their childhood. This brings expectations to those who have dyslexia with opportunities and make way for normal integration into the society, which is otherwise extremely difficult due to their disabilities.

Having suffered from inattentive type of ADHD (Attention-Deficit/Hyperactivity Disorder), I feel obligated to carry out further research on the nature of social barriers dyslexic school age children face today, and seek effectiveness of various tools and new technologies which are expected to play positive roles into their lives in a changing social environment that is increasingly being dominated by digital connectivity.

## Statement of Purpose and Research Questions

The objective of this research proposal is to study the trend of continuously changing ICT (Information and Communication Technology) tools and services that have contributed positively to dyslexic students, and continue to evolve and play greater impact overcoming learning impairments as well as social/physiological barriers faced by dyslexic students. This study has a list of pre-identified dyslexic users' friendly ICT tools and programs available currently and being used widely by various users. The ultimate goal is to identify, justify and create awareness of the need for effective methods, tools and programs. These tools would be essential for dyslexic students - just as essential as for students with physical disabilities to use wheel-chairs to get to their classroom desks (Edyburn, 2006).

This paper has s predicted that selected ICT tools and programs, if further developed and meet certain expectations then they will eliminate major difficulties dyslexic students face today. Therefore, the future developments of technologies must consider dyslexia factors in their design and develop tools that are dyslexia-proof. Doing so, the world will definitely see that being dyslexic is not a cause of grief anymore since dyslexic individuals will be able to integrate with others relatively more in ease as the human dependency on ICT increases. This view brings us to the following questions.

1. Does digital connectivity driven by ICT create better learning opportunities for school age children with dyslexia?
2. Which features of ICT driven tools and services help eliminate or improve dyslexic students' interactions with others normally without noticing dyslexia?

## Review of the relevant literature

Please see "*Reviewing Literatures on Learning Barriers (caused by Dyslexia) and Search for Effective Technology Driven Solution*" ([MChowdhuryFA1.pdf](#)).

## Methodology

### *Research design*

This research proposal is based on quasi-experiments, descriptive and correlational in manner, and will conduct a longitudinal study with repeated observation over a long period of time. The study will be translating the intellectual developmental and social behavior changes of the dyslexic students into a form of collectable observational data during a given period of time. The data will be collected from two separate groups of students. One group will be under current natural learning environment in schools, the other will be using selected verities of up-to-date and popular ICT driven tools and services over the given period of time.

### *Procedure and Description of Participants*

Essentially the study will involve observing and describing the learning performance and sociological behaviors of the students in two classroom settings, where each group will have three students with learning disabilities related to dyslexia. The dyslexic students will be part of a larger classroom environment having twelve to fifteen students all together.

This study will do a longitudinal collection of data covering the past 5 years as well as 5 years in the future. Thus, the study will require data collection from both past and future, or *pretest* and *posttest* scenarios of two comparison groups. The data will be collected through school records, school exams, class tests, assignments, internet and other interactive test activities including computers games. Finally interviews involving the dyslexic students, their parents and teachers.

The first group will have three dyslexic students aged between 9 and 10. The students will be referred as Cont-A, Cont-B and Cont-C in the research procedure. All three students are expected to have been diagnosed with specific learning disabilities related to dyslexia. It is also expected that student Cont-A will have trouble understanding spoken language and poor reading comprehension. The other two Cont-B and Cont-C will have general difficulties with their reading and writing abilities with frequent spelling errors. The three dyslexic students will be intergraded with a group of 10 to 13 other students in a classroom of a similar age group who have shown no noticeable learning difficulties. This group of students will be known as the Control Group. This will have a teacher applying traditional techniques with minimal use of technologies in a normal classroom environment in BC, Canada. In this control group, remaining students could be identified as Cont-1, Cont-2 progressively.

The second group will have a similar number of students in a classroom where at least three of the students aged 9 and 10 will have learning disabilities related to dyslexia, one with trouble understanding spoken language, poor reading skills and comprehension, who will be referred to as student Exp-A. The other two students are expected to suffer from having general difficulties in their reading and writing abilities, with frequent spelling errors. They will be referred to in the research procedure as students Exp-B and Exp-C respectively. Under a quasi-experimental design, the

students in entire classrooms, not only the dyslexic students are assigned to special treatments (Gay, Mills, Airasian, 2009).

Therefore, in the experimental group all students will have access and be encouraged to the use of computers, and the internet as well as assistive software such as word processing with spell checker, talking word processors and word prediction. They will also have access to on-line multiplayer games such as "Counter-Strike" as well as popular online social network sites such as "Facebook", "Twitter" etc. A detailed list of suggested computer and internet based commercially available learning tools, gaming and social websites are given below in Table 1.

<b>Tools/Services</b>	<b>Description</b>	<b>Available from</b>	<b>Cost</b>	<b>Target Users</b>
ReadPlease	Reads any text as one can see on the screen - all purpose text-to-speech software	<a href="http://www.readplease.com">www.readplease.com</a>	Free	Students with reading disability
iPing	A service that sends reminders via email, pager, phone, or fax	<a href="http://www.iping.com">www.iping.com</a>	Fee	Students with poor working memory
Kurzweil 3000	(A scan and read system that converts printed text into digital text	<a href="http://www.kurzweiledu.com">www.kurzweiledu.com</a>	Fee	Students with reading disability
SparkNotes	A collection of notes, resources, summaries, and study aids	<a href="http://www.sparknotes.com">www.sparknotes.com</a>	Fee	Students with reading disability
Windows to the Universe	Features multi-level reading material on space	<a href="http://www.windows.ucar.edu">www.windows.ucar.edu</a>	Fee	Students with reading disability
Visual Thesaurus	Software and web site to graphically display synonyms and more	<a href="http://www.visualthesaurus.com">www.visualthesaurus.com</a>	Fee	Students with Poor vocabulary

Assignment Calculator	A tool to break a large project into manageable daily tasks	<a href="http://www.lib.umn.edu/help/calculator/">www.lib.umn.edu/help/calculator/</a>	Free	Student with poor Organization and writing ability
WebMath	Calculating tool that supports math from grade to graduate school	<a href="http://www.webmath.com">www.webmath.com</a>	Free	Students with Math disability
Interactive Math	Online virtual math manipulatives, makes the abstract concrete	<a href="http://matti.usu.edu/nlvm/nav/vlibrary.html">matti.usu.edu/nlvm/nav/vlibrary.html</a>	Free	Student with Math disability
Skype	Instant messaging, VoIP tool	<a href="http://www.skype.com">www.skype.com</a>	Free	All users
Wordpress	Bloggng tool	<a href="http://www.wordpress.com">www.wordpress.com</a>	Free	All user
Google Search	Web search tool	<a href="http://www.google.com">www.google.com</a>	Free	All user
Twitter	Micro blogging tool	<a href="http://www.twitter.com">www.twitter.com</a>	Free	All user
Wikipedia	Collaborative encyclopedia	<a href="http://www.wikipedia.com">www.wikipedia.com</a>	Free	All user
flickr	Photo storage/ sharing site (and mobile version)	<a href="http://www.flickr.com">www.flickr.com</a>	Free	All user
Ning	Social networking tool	<a href="http://www.ning.com">www.ning.com</a>	Free	All user
YouTube	Video hosting/ sharing site (and mobile version)	<a href="http://www.youtube.com">www.youtube.com</a>	Free	All user
iTunes	Music and podcast player	<a href="http://www.itune.com">www.itune.com</a>	Free	All user
Google Earth	Satellite and aerial imagery	<a href="http://www.google.com">www.google.com</a>	Free	All user
Remember the Milk	Manage tasks	<a href="http://www.remembethemilk.com">www.remembethemilk.com</a>	Free	All user
FreeMind	Mind mapping tool	<a href="http://www.freemind.com">www.freemind.com</a>	Free	All user
Jott	Voice to text tool	<a href="http://www.jott.com">www.jott.com</a>	Free	All user

Table 1

Table 1 Data Source:

1. Centre for Learning & Performance Technologies, (2009)
2. Edyburn, (2006)

The suggested technologies in Table 1 will be asked to use completing school related tasks by all students in Experimental group whenever they feel is needed and will be integrated into the group's class curriculum.

### *Data Collections and Limitations*

Overall, the study will be emphasizing on the use of comparative data between the two groups and interpret findings under an quasi experimental design which will be produced through observed outcomes and expected to have influence of limited extraneous variables and other unexpected events, such as accident or death of a family member.

There are limitations in such experimental research design which may occur and hinder generating pretest as well as posttest data accurately, such as unwillingness of students themselves as well as parents to disclose or share negative information, lack of communication, misinformation and lack of memories and hard evidence, most of all low expectation for the out come of the research proposal by the participating students and their parents.

### *Variables*

As a quasi-experimental research design, this research proposal has identified 16 different variables in four domains which include: Educational, Emotional, Behavioral and Social development. The variables are broken down under their respective domains below in Table 2.

<b>Domains</b>				
Educational	Knowledge development	Concentration ability	Reading, Writing & Math abilities	Motivation
Emotional	Extroversion / Introversion	Anxiety	Peer-pressure	Self-consciousness
Behavioral	Aggressiveness / Passiveness	Dependency / Independency	Attendance	Intellectual Aspiration
* Social	Socio-economic status	Family environment	Gender / number of siblings / birth order	Ethnicity / minority – majority factor

Table 2: Applies both pretest and posttest scenarios.

Note 1: \* in table 2 represents extraneous variable domain

Note 2: Several of these variable sources are based on Figure 9.1 (Gay, Mills, Airasian, 2009)

### *Data Measurement and Analysis*

The degree of the variables in Table 2 will be scaled from 1 to 10, where 1 is the lowest possible strength of the variable and 10 is highest possible strength. A systematic measurement and collection of the observational data is to be determined using a theory of operationalization of the variables including a workable mechanism of the logical relationships between the variables.

### Ethical Considerations

Study as such could bring us to be concerned with very important issues. Such as treating persons with respect and preventing persons to lose confidence, suffer emotional breakdown during these long period of research study due to unexpected occurrence. The nature of such research project does provide the potential for conflict

and harm. As researchers we are morally bound to obtain informed consent, conduct research in a manner that minimizes potential harm to those involved in the study, and maintain participants' privacy. However, it will be hard to maintain all situations that present ethically clear actions. (Gay, Mills, Airasian 2009).

### Significance of the Study

We already know that most dyslexic children have an average or above average intelligence, therefore they have potentiality of smarter minds of the future. It would be great disadvantages and lose for a community, a school district, or a nation to waste such intelligence by not providing proper access and proper tools to nourish such young minds.

As the dependency of the society on ICT increases, now is the chance for young learners with dyslexia succeed with dyslexic proof tools that will transform the dyslexic population into a productive force. The local and country-wide educational authorities need to embrace an innovative strategy to address these challenges by encouraging development of such tools. The main purpose of this study is to create the much needed awareness for this requirement by providing a clear research outcome which will prove that future ICT solutions can encounter dyslexic disability challenges successfully. A positive outcome of this research proposal will also initiate a commercial based competition for dyslexic friendly software and hardware market. These new innovations also should be implemented or integrated in educational systems and work places accessible to all users, whether dyslexic or not. If this happens, the world will definitely see the word dyslexia disappear from its memory.

## References

NeuroDys (2008). Retrieved from: German Dyslexia and Dyscalculia Association (BVL) International Conference – State-of-the-Art in Dyslexia and Dyscalculia Research. Retrieved March 17, 2009, from <http://www.neurodys.com/>

Gay, L. R., Mills, G. E., Airasian, P. (2009) *Education Research Competencies for Analysis and Applications*, Pearson Education, N.J.

Edyburn, D.L. (2006). Assistive technology and mild disabilities. *Special Education Technology Practice*, 8(4), 18-28, Retrieved April 9, 2009, from <http://www.2learn.ca/institute/institute2007/institute07resources/SETP84mild.pdf>

Centre for Learning & Performance Technologies (2009). Retrieved on April 20, 2009 from <http://www.c4lpt.co.uk/recommended/top100.html>