Hypersmart Kids: a Case Study on the Response of Students with Dyslexia and ADHD to Educational Software Games in English Language Learning

Presented by
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Setting

• Dyslexia Association of Singapore
  • Partly funded by Ministry of Education, Singapore
  • 10 learning centers across Singapore

• English language in Singapore
  • Multilingual society
  • Compulsory bilingual education
  • “Singlish” (a colloquial form of English)
What is Dyslexia?

_Noun._ A learning disorder marked by impairment of the ability to recognize and comprehend written words.

1. It is **NOT** due to
   - lack of intelligence
   - poor education
   - family background
2. It runs in the family
3. It is a Life-long condition
4. A Hidden handicap
5. Often misunderstood and called ‘lazy’, ‘stupid’ or ‘not motivated’
Reading

Difficult recognising familiar words

Trouble reading nonsense words

Dividing words into syllables

Substitution of words of similar meaning

Blending letters together

Misses out or adds extra words
<table>
<thead>
<tr>
<th>Spelling</th>
<th>Corrected</th>
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<td>jogging</td>
<td>bawl</td>
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<tr>
<td>carrying</td>
<td>carrying</td>
<td>panting</td>
<td>panting</td>
</tr>
</tbody>
</table>
What is ADHD?

Attention Deficit Hyperactivity Disorder

- Inattention
- Hyperactivity & Impulsivity

* combination

Inattention

- often fails to give close attention to details or makes careless mistakes in schoolwork, work or other activities;
- often has difficulty sustaining attention in tasks or play activities;
- often does not seem to listen when spoken to directly;
- often does not follow through on instructions and fails to finish schoolwork, work, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions);
- often has difficulty organizing tasks and activities;
- often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework);
- often loses things necessary for tasks and activities (e.g., toys, school assignments, pencils);
- is often easily distracted by extraneous stimuli;
- is often forgetful in daily activities.
often fidgets with hands or feet or squirms in seat;
often leaves seat in classroom or in other situations in which remaining seated is expected;
often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness);
often has difficulty playing or engaging in leisure activities quietly;
is often “on the go” or often acts as if “driven by a motor”;
often talks excessively.
Videos of

A typical ADHD & Dyslexia class
Why focus on ADHD children

30% of dyslexics have ADHD.

* International Dyslexia Association
1:1 interaction
Literacy Software
Nessy Learning Programme

Designed together with Bristol Dyslexia Centre

- Phonics
- Spelling Rules
- Sight Words
- Writing
Award Winning Software

Special Education Needs ICT Category

- Animated Rules
- Games
- Worksheets
- Teaching Notes
Animated Explanations
Spelling Games
Reward System
WORD SHARK v.4
Game-based learning
Spelling Game

Spell nothing
Does ICT play a role in motivating dyslexic students with ADHD to stay on task, thereby improving their reading and spelling accuracies?
Profiles
Profile A

- Primary 5 boy
- 3 years in DAS
- clinically diagnosed ADHD
- not on medication
- reading, spelling
Profile B

• Primary 4 boy
• 2 years in DAS
• not diagnosed ADHD
• reading, spelling above his age
• performs well in school
Profile C

- Primary 3 boy
- recently joined DAS
- clinically diagnosed ADHD
- on Ritalin
- reading, spelling of an 8 year old
Profile D

- Primary 3 girl
- 4 years in DAS
- Clinically diagnosed ADHD
- On Ritalin
- Reading, spelling slightly below her age
Essential Literacy Approach

Based on the 6 principles of Orton-Gillingham Approach...

- Phonograms
- Spelling Rules
- Prefix, Suffix
Lesson Structure

- Reading, Spelling
- Others (Compre, Writing etc.)
- 20 mins computer
Videos of
What happens in class now?
Results
Observations

- Enhanced motivation
- Enhanced engagement

Can we play Nessy today?
## Criterion-Referenced Tests

Over 20 weeks...

<table>
<thead>
<tr>
<th>Student</th>
<th>Single-Word Reading</th>
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<th>Single-Word Spelling</th>
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<td>Post-Test</td>
<td>Pre-Test</td>
<td>Post-Test</td>
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<td>A</td>
<td>20/30</td>
<td><strong>20/30</strong></td>
<td>10/20</td>
<td><strong>11/20</strong></td>
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<tr>
<td>B</td>
<td>27/30</td>
<td><strong>28/30</strong></td>
<td>15/20</td>
<td><strong>15/20</strong></td>
</tr>
<tr>
<td>C</td>
<td>23/30</td>
<td><strong>21/30</strong></td>
<td>13/20</td>
<td><strong>14/20</strong></td>
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<tr>
<td>D</td>
<td>23/30</td>
<td><strong>19/30</strong></td>
<td>11/20</td>
<td><strong>13/20</strong></td>
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Inconsistency

unless
belong
subway
comic
candle
enjoy
pretend
remain
manse
for head

unless
Belong
Subway
comic
candle
enjoy
pretend
remain
manse
forehead
### Increased accuracy

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<td>backwards</td>
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<td>misfire</td>
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<td>express</td>
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<td>damage</td>
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<td>degage</td>
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<td>envious</td>
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<tr>
<td>telegraph</td>
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</tbody>
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| Kindess | tremble | backwards | misfire | express | depart | bandage | active | capture | dangerous | happily | envious | telegraph | fright | nurse | knock | spread | eigement |
Computers only?
Strategies that Work

✓ Immediate feedback
✓ Multi-sensory
✓ Student-centered
✓ Novel stimuli
✓ Game-like approach
Limitations & Future

• Uncontrolled factors
  *e.g. novelty, keyboarding skills*

• ICT = It Can’t Teach

• Older group of students

• Other specific learning differences *e.g. dyspraxia*

• A longer period of study needed
References


Thank you

Q&A

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