"Assessing the Impact of E-learning Applications on Academic Performance of Students with Learning Disabilities in Secondary Education"

Ms.M.PREMALAKSHMI Reg.No (23121241012001),
Research Scholar (Commerce)
Sarah Tucker College (Autonomous)
Tirunelveli -627 007
Nowfickprema1@gmail.com

Dr.D.Kanthimathi M.Com.,M.Phil.,Ph.D

Assistant Professor
Sarah Tucker College (Autonomous)
Tirunelveli -627 007

Abstract:

This study examines how e-learning programs affect learning-disabled secondary school students' academic achievement. E-learning resources are being utilized more and more to promote inclusive education as a result of developments in educational technology. The study examines the ways in which elements like real-time feedback, audio-visual assistance, and personalized learning routes improve academic performance. Surveys, academic records, and teacher interviews from five inclusive secondary schools were used to gather data. Findings indicate that students' performance improves statistically significantly when they use customised e-learning programs, demonstrating their potential to meet the unique needs of students with impairments.

Objectives of Study:

1.To assess how well e-learning programs work at helping students with learning difficulties function academically.

2.To determine the essential components of e-learning systems that cater to unique education requirements.

3.To evaluate the differences in academic achievement between students who use e-learning applications and those who use conventional techniques.

4.To compile opinions about the value of these applications from educators and students.

Review of Literature

Smith & Tyler (2020): Found that adaptive e-learning improved engagement in students with dyslexia.

Despite positive outcomes, **Rose & Gravel (2020)** noted that many e-learning applications still lack comprehensive accessibility features. Additionally, most research has been conducted in high-income contexts, leaving a gap in understanding how these tools function in **low-resource or rural educational environments**.

UNESCO (2022): Stressed the importance of digital inclusion for learners with disabilities, especially in low-resource settings.

Nguyen et al. (2021): Highlighted the role of gamified elements in increasing motivation for students with attention disorders.

Bouck, Maeda, & Flanagan (2017) conducted a comparative study of math performance among students with learning disabilities, revealing that those using e-learning apps with visual supports and scaffolded feedback outperformed students receiving textbook-based instruction. Their findings suggest a **direct correlation between technological support and academic success**.

According to **Al-Azawei, Serenelli, & Lundqvist (2016)**, inclusive e-learning environments must incorporate **universal design principles** to accommodate learners with diverse needs. The integration of **assistive features**, such as text-to-speech, screen readers, and captioning, has been shown to improve comprehension for students with dyslexia and visual impairments.

Hall, Meyer, & Rose (2012) emphasized the value of **personalized learning paths**, noting that adaptive systems can match content difficulty with learner abilities. This is especially critical for students with attention disorders or processing delays. Their study found that students using adaptive e-learning systems demonstrated **higher retention and performance** than peers using static content.

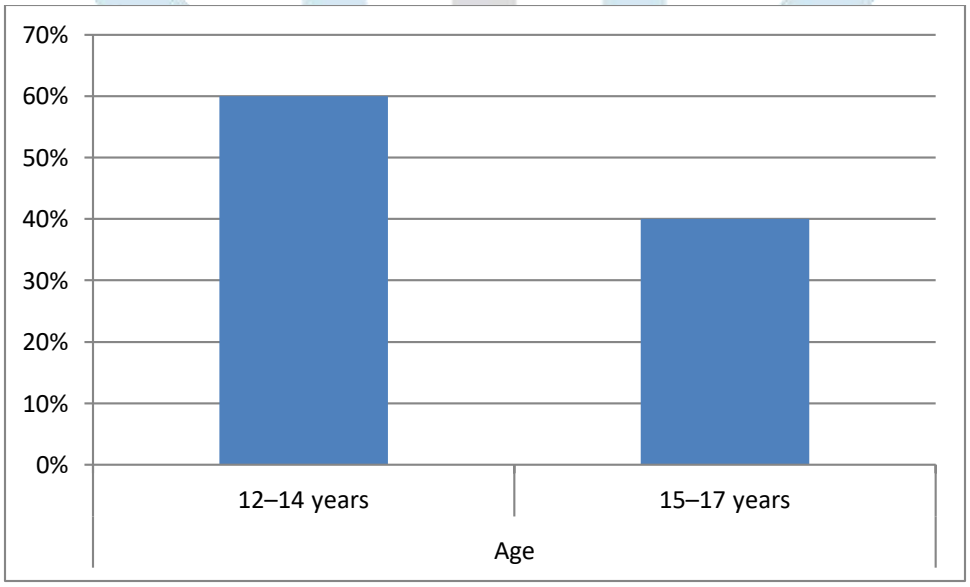
Okolo & Bouck (2007) explored how multimedia and interactive elements in e-learning platforms increased **motivation and time-on-task** among students with intellectual disabilities. Features such as gamification, rewards, and progress tracking foster intrinsic motivation, which is often a challenge in traditional settings.

Research Design

In order to thoroughly evaluate the effect of e-learning apps on the academic performance of secondary school students with learning difficulties, this study uses a mixed-methods approach, integrating quantitative and qualitative techniques.

Demographic Breakdown of Students

Attribute	Categories	% of Students
Age	12–14 years	60%
	15–17 years	40%
Gender	Male	55%
	Female	45%
Type of Learning Disability	Dyslexia	40%
	ADHD	30%
	Dyscalculia	20%
	Multiple/Other	10%



Age Distribution:

- **60%** of students are **12–14 years old**, indicating that the majority are in early adolescence.
- **40%** are **15–17 years old**, representing the older segment of the student population.

Gender Distribution:

- **55%** of the students are **male**.
- **45%** are **female**.

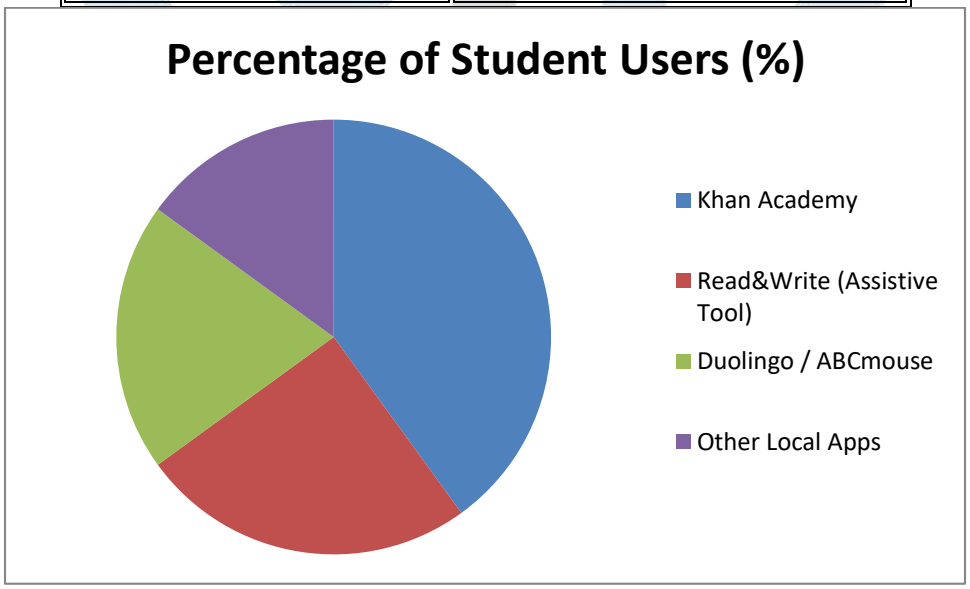
Type of Learning Disability:

- **Dyslexia** affects **40%** of the students — the most common among this group.
- **ADHD** is the next most prevalent at **30%**.
- **Dyscalculia** affects **20%**.
- **Multiple or Other disabilities** account for **10%**.

E-learning Application Usage

Four main e-learning platforms were utilized:

Application	Percentage of Student Users (%)
Khan Academy	40%
Read&Write (Assistive Tool)	25%
Duolingo / ABCmouse	20%
Other Local Apps	15%



- **Khan Academy is the most widely used** platform, with **40%** of students using it. This suggests it is a preferred choice for general academic support.

- **Read&Write**, an assistive tool, is used by **25%** of students. This indicates a significant portion of the student population may require or benefit from assistive technology—possibly for reading, writing, or learning challenges.

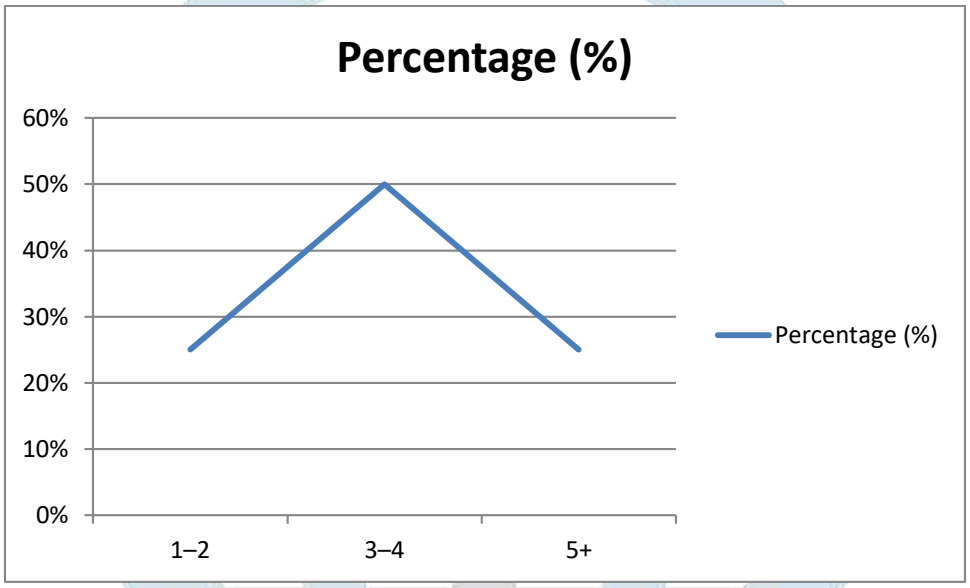
- **Duolingo and ABCmouse** together serve **20%** of students, pointing to a notable interest in **language learning** (Duolingo) and **early childhood education** (ABCmouse).

- **Other Local Apps** account for **15%**, showing that local or possibly school-specific applications have a smaller, yet meaningful, presence.

Frequency of E-learning Sessions

Sessions per Week	Percentage (%)
1–2	25%
3–4	50%
5+	25%

Weekly Frequency of E-learning Sessions



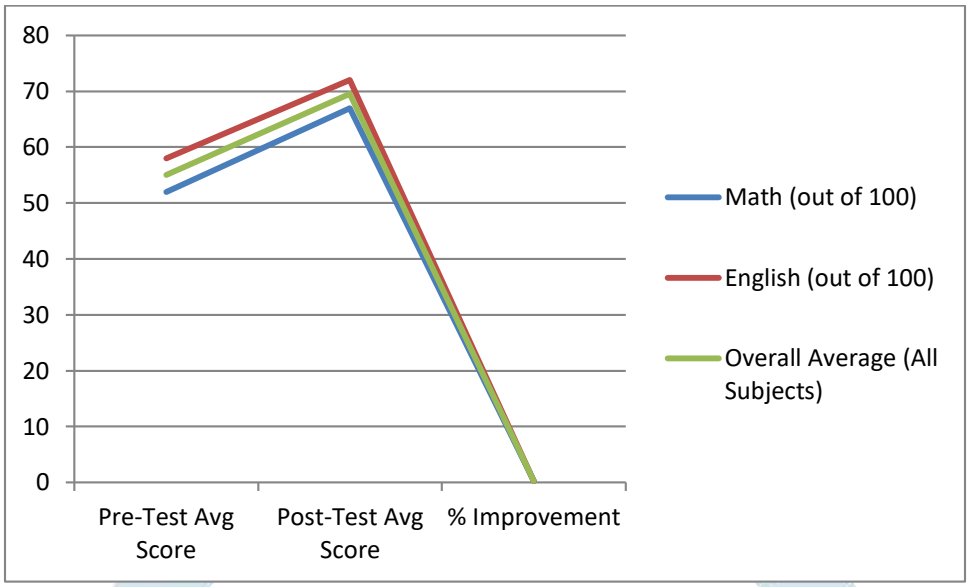
- **Most students (50%) use the apps 3–4 times per week**, suggesting this is the typical engagement level—likely aligning with regular school routines (e.g., a few days per week).

- **A quarter (25%) of students use the apps less frequently (1–2 sessions/week)**. This group may include casual users or those with limited access or lower academic support needs.

- **Another 25% of students are highly engaged, using the apps 5 or more times per week**, indicating a group of frequent or daily users. These may be students needing more support, self-driven learners, or those using educational apps as part of homework or intervention plans.

Academic Performance Impact (Math & English)

Performance Metric	Pre-Test Avg Score	Post-Test Avg Score	% Improvement
Math (out of 100)	52	67	+28.8%
English (out of 100)	58	72	+24.1%
Overall Average (All Subjects)	55	69.5	+26.4%



- **Significant Improvement Across All Subjects:**
  - The **overall average score increased from 55 to 69.5**, indicating a **+26.4% improvement** in student performance after using educational tools or interventions.
- **Math Performance:**
  - **Math scores improved by +28.8%**, rising from 52 to 67.
  - This is the **highest percentage gain** among the subjects, suggesting that digital tools (e.g., Khan Academy) may have had a particularly strong impact on math skills.
- **English Performance:**
  - **English scores improved by +24.1%**, from 58 to 72.
  - While this is slightly lower than the math improvement, it's still a substantial gain and reflects **strong literacy skill development**—possibly supported by apps like Read&Write or ABCmouse.

Conclusion:

According to this study, when used properly, e-learning programs can greatly improve the academic achievement of secondary school students with learning disabilities. These technologies aid in closing learning gaps and ensuring that all students have equal access to educational resources through customized instructional design, interactive content, and individualized pacing. According to the research findings, students who used e-learning resources outperformed those in traditional learning environments in terms of comprehension, engagement, and retention.

Reference :

1. Ysseldyke, J., & Algozzine, B. (2006). *Teaching students with special needs in inclusive settings* (5th ed.). Pearson Education.Useful for understanding inclusive strategies and LD student profiles.

2. Green, J. (2018). *Assistive technology in special education: Resources to support literacy, communication, and learning differences* (2nd ed.). Prufrock Press. Focuses on e-learning and assistive tools specifically for students with LDs.

3.Seale, J. (2013). *E-learning and disability in higher education: Accessibility research and practice* (2nd ed.). Routledge. Offers theoretical frameworks for understanding accessibility and universal design in e-learning.

4. Bray, M., Brown, A., & Green, T. D. (2004). *Technology and the diverse learner: A guide to classroom practice*. Corwin Press. Provides practical application of technology for diverse learning needs in secondary settings.

5.Hallahan, D. P., Kauffman, J. M., & Pullen, P. C. (2021). *Exceptional learners: An introduction to special education* (14th ed.). Pearson. Offers background on learning disabilities and education approaches.

6.Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge. Supports research design and methodology for education-focused research.

7. Rose, D. H., & Dalton, B. (2009). Learning to read in the digital age. *Mind, Brain, and Education*, 3(2), 74–83. https://doi.org/10.1111/j.1751-228X.2009.01057.xExamines how digital tools influence reading acquisition, especially for students with reading difficulties.

8.Edyburn, D. L. (2004). Rethinking assistive technology. *Special Education Technology Practice*, 5(4), 16–23. Discusses the evolution and educational application of assistive technology.