

# Research Document

## **Main Research Question :**

*“How can we enhance the DIFLA Trainer by incorporating gamification strategies and a screen divider to better support and motivate children with (potential) dyslexia, specifically focusing on improving engagement with flashcard-based learning in a kid-parent collaborative environment ?”*

Introduction here

## ***Literature Review Conclusions :***

***Sub-Research Question 1 : How can the current DIFLA app be improved in order to enhance the learning outcomes for children with (potential) dyslexia, while also upgrading the user-experience?***

In conclusion, based on the information gathered from the above literature review, we can conclude that enhancing the DIFLA app to improve learning outcomes for children with (potential) dyslexia while upgrading the user experience is possible, and there are areas where these improvements could be implemented.

Validating on the current DIFLA Trainer's user experience based on fonts, colours and general layout, its noticed that a lot of correct design choices have been taken from the previous iterations of prototypes. An area where the user-experience could be improved is the accessibility features provided to kids and parents. Specifically, features like text-to-speech, font-type selection, text-customisation and lastly a simple walkthrough (without a lot of text), to guide the kids and parents on the learning platforms features and overall functionally. These accessibility features could upgrade the user experience when interacting with the prototypes and final product. Lastly, a recommendation can be made on the fonts, where the specialised font Dyslexie could be added as an additional font for the users to select and use. The aforementioned recommendations could also provide beneficial for enhancing the learning outcomes of the trainer.

***Sub Research Question 2 : How can children with dyslexia stay engaged during the learning process while using the DIFLA app?***

To conclude, the review highlights that children with dyslexia have challenges in maintaining focus during learning and it is intensified by their reading difficulties. However, various strategies provide a way forward for improving their attention and involvement in learning processes. Multisensory learning approach is an inclusive way of all-round teaching as well it helps to build retention and concentration through engaging different senses. Furthermore, multimedia learning, particularly through digital storytelling, accommodates diverse learning

styles, with narration and text emerging as particularly effective. Additionally, when new information is put into contexts that are familiar to learners then it becomes easy to understand, while also emphasizing clean design principles minimizes visual distractions, facilitating enhanced focus. Furthermore, including game elements can create an engaging environment that can improve the children's focus. By incorporating these approaches, the DIFLA app offers hope in building better environments where children with dyslexia can learn best thereby improving both focusing and learning outcomes.

***Sub Research Question 3 :What gamification techniques can be included to enhance the overall user experience for kids with potential dyslexia?***

In conclusion, the literature review highlights the importance of gamification as a motivational tool for dyslexic students. The challenges faced by these students—particularly in terms of low motivation and self-esteem due to the difficulties they face during school are significant and most times traditional school settings do not cater to their needs.

However, integrating game-like elements into educational tools for dyslexia can help transform repetitive and often demotivating tasks into engaging and competitive activities, gamification primarily serves to boost motivation, making learning more engaging and enjoyable which will lead to enhancing student's learning outcomes ,this approach not only encourages students to eagerly complete their lessons but also helps shift how dyslexia is perceived.

Moreover gamification can allow students to progress at their own pace and also enhance their experience by providing clear and visible markers of achievement such as points, badges or other rewards that can be purchased from the DIFLA store.

Overall , gamification not only addresses the specific learning needs of dyslexic students but also provides an inclusive learning environment that can help reduce the stigma associated with learning disabilities while also empowering students by aligning educational practices with their unique strengths and learning styles.

***Sub Research Question 3: How can a physical tablet screen divider be developed that would support user engagement levels during practice?***

In conclusion, despite the recognised potential of physical tablet screen dividers to enhance user engagement by minimising distractions and maintaining focus, there is a significant gap in research exploring them. While design considerations for such dividers have been outlined, comprehensive studies assessing their impact across various contexts and user groups are notably lacking. Thus, further research in this area is crucial to understand the true potential and

limitations of physical dividers in supporting user engagement during practice sessions on tablets.

***Sub Research Question 5 : How can parents and children be effectively motivated in their interactions with the DIFLA Trainer?***

In conclusion, motivating children with dyslexia and their parents is crucial for successful learning outcomes. While strategies like goal-setting, improving feedback, and gamification are valuable, one key element that emerges is the importance of positive reinforcement through rewarding experiences and concrete rewards. Children often find experiential rewards like special outings, activities or privileges to be highly motivating. The novelty and excitement of these rewards can spark their engagement and interest. Similarly, concrete rewards like toys, books or other age-appropriate items can be powerful motivators for children. Earning a coveted item provides a sense of achievement. Incorporating these types of positive reinforcements, alongside other evidence-based motivational techniques, can create an environment that enhances motivation in children with potential learning difficulties. An approach that includes fundamental motivators tailored to each child's interests has the potential to improve learning outcomes. By understanding what motivates children, interventions and learning tools can maximize engagement and progress for children with potential learning difficulties and their families.

***Sub Research Question 6 : How can parents and children be effectively supported in their interaction with the DIFLA?***

The information I have gained from these papers is that parents are very keen on the safety of their children. They value privacy above all and want a safe space for their children. But parents would like to see their children to use an app individually as parents might not have time for their children, to be there with them using the app together. This is a valid option as parents might have little time and if our app focusses solely on using the app together then the working and main feature of the app might be lessened.

Another thing I found is that parents are influenced by their child, this is because most parents do want the best for their child and want to help them with their reading difficulties. These are valid options but also need to be taken in consideration when using the app itself. But since parents are keen on safety on the app, means that the app needs to provide a safe space for the children that use this app. The parents do need to search quite some information on what dyslexia is and how it works. Therefore, the app needs to show a good understanding of the problem and a knowledge field.

Overall parental support is a very important aspect of an app, this can either make or break the app as parents are very keen on the privacy and safety of their children. To make a parental view in the app is a very important aspect of the app itself since parents can see their children progress and see in one view how well their child is doing.

## **Literature Review Conclusion**

The literature review highlights several key insights that can enhance the DIFLA app to better support and motivate children with (potential) dyslexia:

1. **Gamification and Engagement:** incorporating gamification elements such as optional reading/spelling games, custom videos, level-based systems, and multimedia storytelling can transform repetitive tasks into engaging and motivating activities. This helps boost motivation and make learning more enjoyable for dyslexic students.
2. **Parental Support:** providing a dedicated parental section with features like progress tracking, parental locks, and information on dyslexia can effectively support parents and strengthen the child-parent collaborative learning experience. Enabling connections with schools or speech therapists can further reinforce this support.
3. **Accessibility and User Experience:** improving accessibility through customizable font types, text-to-speech options, and simple walkthroughs can significantly upgrade the user experience for both children and parents. Adopting specialized fonts like Dyslexie can also enhance readability.
4. **Multisensory and Multimedia Approaches:** leveraging multisensory learning, digital storytelling, and familiar contexts can accommodate diverse learning styles, improve focus and retention, and create more inclusive environments for children with dyslexia. By incorporating these evidence-based strategies, the DIFLA app can be enhanced to better engage, motivate, and support children with (potential) dyslexia, leading to improved learning outcomes.

## ***Competitor Analysis Conclusions :***

***Sub-Research Question 1 : How can the current DIFLA app be improved in order to enhance the learning outcomes for children with (potential) dyslexia, while also upgrading the user-experience?***

Based on the above analysis, in combination with the literature study conducted, the current

DIFLA apps learning outcomes can be improved by incorporating gamification elements as well as provide accessibility options for the app. Observations were made on the competitors, having most learning platforms incorporate gamification elements. Gamification elements that can be implemented in order to enhance the learning outcomes are as follow:

1. Implementation of optional games for reading & spelling ( as well as writing).

- Letter drawing game were the kid can track the letter with the finger.
- Voice spelling game were the microphone is enabled for letter recognition.
- Storytelling reading letter with parental assistance.

2. Implementation of custom videos for each letter.

3. Level based system.

Regarding the accessibility options that can implemented on the app, these are as follows:

1. Font types accessible to users.

2. Text-to-Speech menu options.

Lastly, as for upgrading the user-experience, information was gathered from the literature study, as well as the competitor analysis on the following:

1. Audio or visual formats for enhancing learning experiences.

2. Clear navigation based on repetitive structures.

3. Inform learners on how they should navigate your platform (walkthrough, onboarding experience).

4. Parental section (can provide parents access to progress tracking, avoiding discouragement and competitiveness displayed to the kid).

***Sub Research Question 2 : How can children with dyslexia stay engaged during the learning process while using the DIFLA app?***

Conclusion : In conclusion, the competitive analysis reveals a diverse methods to keep kids with potential dyslexia focused during the learning process.

WordSmart is a free app that uses multimedia storyline while also including multisensory learning. The app incorporated letter tracing to aid shape-sound matching. Process feedback is also included (pre and post-testing). A reward system is also embodied.

Lively Letters-Phonic aims to practice letter sound associations by using colorful pictures of characters embedded into letters, and songs. The app includes game elements by incorporating word play.

Simplex Spelling involves a “reverse phonics” approach - sounds made by all the different letter combinations. Letter by letter feedback system provides immediate feedback. There is also an option to track the children's progress.

Bob Books Reading Magic is slowly introducing new letter sounds, using consistency, repetition and stories that fit short attention spans. The app has four game levels increasing learn-to-read challenges.

Writing Wizard fun tracing using 50+ animated stickers, sound effects and interactive games that animate letters at the end of tracing. There are various options for customization, for example the fonts.

In conclusion, the majority of the apps have incorporated different game elements. Most of the apps use multimedia and multisensory learning. Some of the apps have included a storyline by using the multimedia learning method.

### ***Sub Research Question 3 :What gamification techniques can be included to enhance the overall user experience for kids with potential dyslexia?***

During the competitor analysis I was able to get a lot of inspiration on how to add gamification elements to the current DIFLA app and how important gamification is to keep the kids engaged and motivated while learning.

The apps that I found to be most useful and inspiring are :

LingoKids : Lingo kids offers great lessons and activities for kids , it has videos that tell stories while also incorporating exercises within the video they also offer a Neurodiversity categories that has dyslexia subcategory where kids with dyslexia can learn more about phonics , how to spell and write letters and much more.

LingoKids also did a great job at separating the kids and parents sections and providing a clear and easy to follow progress tracking page for parents in order to know how far their kids are going , they also offer a blog that provides support to parents by presenting great articles about Dyslexia foe example.

The biggest downsides with LingoKids is that most of these features are paid and the free version offers very little, so parents have to buy the premium version to unlock all these features including dyslexia activities.

Firstsentence : FirstSentence, created with the help of a speech therapist, initially set high expectations, unfortunately the application fell short in several key areas, **the user experience and interface design were both unpleasant and appeared outdated, additionally, the app provides only one free section designed to aid children in learning to read, which is insufficient.** Unlike to what was shown in the Playstore promotional materials, the phonics section is absent, leading to a disappointing user experience.

Nessy : **Nessy offers great resources and different apps that can help kids with different topics such as spelling and reading** and they are recommended by a lot of people however, the design wasn't cohesive and it looked very messy, the app was a PWA app so it doesn't fully feel like an app and it lacks structure and a good navigation, they also offer a lot of paid material that is better than the free ones

Jolly Phonics : Jolly Phonics is the closest example to the current DIFLA app, but it offers a lot more and it was a great source of inspiration for example they offer **games that help kids with phonics and spelling, they also offered songs that can motivate kids to work on their pronunciation and lastly they have a letter tracing game where kids can learn how to write each word based on sound.**

In conclusion this competitor analysis showed some great examples of how to gamify and add gamification elements to the current DIFLA app in order to make the user experience more fun and enjoyable and less stressful.

### ***Sub Research Question 5 : How can parents and children be effectively motivated in their interactions with the DIFLA Trainer?***

To summarize, the reviewed apps: GraphoGame, Read With Phonics, and Endless Reader, are providing creative methods for improving phonemic awareness, sight word identification, and reading comprehension. These applications highlight the value of rewarding kids for their accomplishments by using gamified components and tailored learning paths to motivate the kids. These motivation techniques are included into the applications so that they not only keep kids interested but also create a positive learning environment. Additionally, the focus on features that evaluate the progress and parental involvement shows how important it is for parents to assist and reinforce their children's learning experiences.



***Sub Research Question 6 : How can parents and children be effectively supported in their interaction with the DIFLA?***

When looking at the table, there are different kinds of choices since all apps have something lacking from their plan. Most apps are behind a hefty paywall making the choice to learn outside of classes more difficult since you need to pay more money to help your kid. There is an ethical part in this because you would want the best for your child so you would pay those amounts.

All the apps are accessible for children (one is not as much but still possible) and that is the core of the apps. They are made for children, so they need to have the children their needs inside such an app. The important part of my competitor analysis is the parental support. Parental support for your child is an essential part of the application itself as you as a parent want to see your child grow and see that they become more confident and happier because they do not have these burdens anymore of their reading difficulties. Therefore, a parental support page is a necessity and needs to provide as much as possible.

The different apps analyzed do have their own way of showing parents important information of their child. Some apps did lack that support which is a bad practise for the growth of their child. Therefore, based on the apps a good parental screen needs to show the following items:

- Progress tracker

- o This way you can see how your child is doing and why they might have some difficulties on some topics.

- Good parental lock

- o Parental locks are there to keep the kids out of the settings of the app and to change their progress, but to make this as efficient as possible it needs a good lock for it. Therefore, a lock with a harder math question or a question only a parent knows needs to be implemented.

- Walkthrough of the app itself

- o Parents might not know about the app itself and it can be confronting when opening the app for the first time. That's why the app needs a good walkthrough on how the app works and which data can be collected as parents are keen on their children their data.

- (possible) connection with schools or speech therapist

- o This way the peer experts can see the progression of the child and see if they are progressing and can help with additional support based on the app.

- Information page

- o Parents might have difficulties with knowing what dyslexia is (or any learning difficulty). By providing a solid source of information, the parents can know about the

topic better.

Lastly for reviews is purely based on what people think of the app, therefore the app itself needs to have a solid base and should be understandable from the start of the app.

## **Competitor Analysis Conclusion**

Based on the findings of the competitor analysis we conclude that in order to enhance the DIFLA user experience, the following elements can be implemented:

### **1. Gamification & Engagement**

Observations were made on the competitors, having most learning platforms incorporate gamification elements. Gamification elements that can be implemented in order to enhance the learning outcomes and help motivate and increase engagement on the current app. These are as follows:

1. Implementation of optional games for reading & spelling ( as well as writing).
  - Letter drawing game where the kid can track the letter with the finger.
  - Voice spelling game where the microphone is enabled for letter recognition.
  - Storytelling reading letters with parental assistance.
2. Implementation of custom videos for each letter/flashcards
3. Level based system.
4. Multimedia storytelling.
  - Videos that tell stories while also incorporating exercises within the video.
5. Visual and Audio Learning.
6. Colorful pictures.
7. Reverse phonics approach
  - Uses sounds made by all the different letter combinations.
8. Reward System.

Implementation of rewards obtained via the DIFLA store, as well as for completion of lessons and games.

## **2. Support & Motivation**

### 1. Parental section.

Have a separate section for kids and parents with the parents section providing clear and easy to follow progress tracking page in order to know how far their kids are going.

### 2. Good parental lock.

Parental locks are there to keep the kids out of the settings of the app and to not change their progress.

### 3. Letter-by-letter feedback system.

### 4. Information page (Optional)

Parents might have difficulties with knowing what dyslexia is (or any learning difficulty). By providing a solid source of information, the parents can know about the topic better.

### 5. Connection with schools or speech therapist (Optional)

This way the peer experts can see the progression of the child and see if they are progressing and can help with additional support based on the app.

