Title: Grade 2 Backpack App:

A Parent-Teacher Collaborative Portable App

for Grade 2 Individualized Learning Support

A Paper Presented in Partial Fulfillment

Of the Requirements of

EDID 6512 Design Project

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Abstract

This design project incorporates the use of technology in improving and expanding the reading time of a mixed abilities Grade 2 class in a Catholic primary school in Roseau, Dominica. The study, which targets a class of 28 students, provides an engaging solution to the class in either supporting the weaker readers or inspiring the advanced ones to further seek knowledge. This is in response to the over crowdedness of the classroom, which makes knowledge absorption for beginning readers not wholly conducive if limited to that learning space alone. The proposed reading app is named "Reading Backpack App", as a reference to its portability and flexibility.

The reading skills that will be explored include sounding out letters, blending and combining letter sounds, matching pictures with words, reading simple texts and applying comprehension skills, such as inferencing, summarizing and drawing conclusions, to understand more complex texts.

Key terms: Primary school, beginning readers, mixed abilities class, Grade 2 class, reading skills, reading comprehension

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Introduction

While the practice of classroom overcrowding provides more students their academic slots, it makes the learning environment unconducive to learning. A class of 18 will be adequately served, which is in keeping with what the Center for Publication (2019) declared as the ideal class size maximum, but recent enrollment has increased the class size to as much as 30 per class. This is the case with Grade 2 Love, a second grade class in a Catholic primary school in Dominica.

Often, two or three of the students in Grade 2 Love cannot even read yet. This makes it difficult for them to work on their own. Unfortunately, they would have to wait to be individually served by a teacher, who is performing other tasks aside from teaching. The 1:30 ratio is even more apparent when placed against these instances of multitasking. Even the children are prone to multitasking themselves: trying to understand the teacher while zoning out disruptive classmates. After all, a hot and packed classroom can result to restlessness, which further distances the children from effectively absorbing the lesson (Jensen, 2008).

Grade 2 Love's main academic problem is the large variation in the range of reading abilities. A few children are still struggling with sounding out pairs of letters. On the other hand, there are children who can read at an advanced level, having even moved on to chapter books. With this disparity in knowledge and abilities, the packed class's students' individual reading needs are not properly addressed within the prescribed hours for Reading classes. The proposed app, however, will provide extra practice that will respond to the personal weaknesses, strengths and abilities of each child. It will allow each student to learn how to read at his own pace beyond the classroom. The app also provides multisensory instruction, which, according to Morin (2019), is necessary in teaching students with attention and learning issues. During the course of

its incorporation into the class, the teacher takes on the role of helper instead of a traditional instructor. The traditional setup is not helping the students learn at their own pace. Instead, the students have to either keep up or slow down to match what the teacher is delivering at any given moment. Cviko, et. al (2011) present a study in which kindergartners make use of a learning app that is similar to the Reading Backpack app. This study's limitations are also similar to that of this paper's proposed app, in that it enacts the Ministry of Education's prescribed curriculum instead of one that the instructors have drafted themselves.

In Grade 2 Love, reading ability is tested through a battery of tests. Each new section is more difficult than the previous ones. Appendix A.1 shows the list of tests that the children have to go through. This set of tests is administered once a term and is set apart from other Language Arts tests because of its one on one nature. It provides a clearer picture of where the students are in terms of their reading levels, but is very time consuming that Schmidt (2018) believes there should be a more time-efficient way to assess the students. This project will then migrate the results of the last two oral reading assessments to the app and use that level as the children's springboard to learning and taking assessment tests at their own pace. These assessments will no longer further infringe on the already strained teaching timetable in the traditional classroom setup, which the primary school does not have any option but to utilize at this point. An actual example of an oral reading test from the Roseau-based primary school is included, under Appendix A.3.

Need for Design

Children with varying reading levels in an overcrowded class will not all be able to cope in a traditional learning setup with one available instructor. The struggling readers will be forced to absorb the fragments of concepts that are beyond what they are capable of understanding at that given point of time. On the other hand, advanced readers will be slowed down in favor of allowing their peers understand the lessons. Either way, there will be a disconnect in the teaching, with some students being overwhelmed and some being bored. This can render instruction futile and students restless. Cohen (2019) cites different reasons behind a lack of motivation: ADHD, anxiety, depression and even giftedness, among others. Sometimes, the solutions only serve those that have learning disorders, such as ADHD, through the Remedial classes. However, the gifted and anxious children may not be considered. In Grade 2 Love, even some tests' difficulty level had to be lowered to accommodate the struggling students. Despite this, there are still children failing Reading Comprehension tests.

A smaller class would have been more manageable for children with mixed abilities because students in smaller classes have been reported by Harfitt (2011) to encourage closer relationships among classmates. This creates a more comfortable learning environment, especially for late bloomers who may be further slowed down in a packed class. Those who are tempted to label some children as mere "late bloomers" who will eventually find their way should note that more likely skill deficits are the real issues involved (Teachers, 2019). These children, who may have been unjustly and inaccurately labelled, should not be allowed to dawdle within their own pace, according to the American Federation of Teachers. Instead, an intervention should be applied as soon as possible because children who have not learned to read before First Grade will more likely always lag behind their classmates.

So, how can the same-pace, mixed abilities class problem be solved? Can reducing the number of children help as preferred by Harfitt? The answer is not that simple, considering that existing studies have only worked on small populations in limited periods of time (Harfitt, 2011). Another study has shown that a smaller class size can make a difference for the better if the programs that are designed to highlight this change are well-conceptualized and properly implemented. (Center for Public Education, 2019). Instructional design is pointed at as the main issue to be resolved. In the Roseau primary school being studied, a smaller class would have addressed not just personalized teaching and attention, but also discipline. Discipline is a factor that can affect learning in the lower grades, but some parents have passed this on the teacher. Unfortunately, reducing the number of students is not a viable option for Grade 2 Love and the rest of the school it is part of.

A small class is not a luxury that some schools can afford. The Roseau-based Catholic primary school in question is a subsidized school, not a fully private school. It charges a minimal fee` and the church pays the teachers' salaries. Hiring teachers will be approved at the government and church level. Moreover, the solution of providing a teacher's assistant will still not work out for the primary school being studied. The college has provided teacher assistants in recent years but this is an aid that has not been, so far, sustained. The teaching assistants are usually assigned to Grade K and Grade 1 classes. Grade 2 to 6 have to depend on the class teachers and the occasional subject teachers. However, everyone is usually stretched schedule-wise that it is mostly the unaided class teacher that provides the instruction for all subjects. During the current school year, all previous teaching assistants have either moved on to other endeavors or have replaced teachers who have retired or resigned.

Teachers can, of course, make use of other methods to alleviate the difficulty of teaching a packed, mixed abilities class. However, paper-based Reading worksheets that should serve to provide extra work have not been successful so far. This is partly due to many of the children's lack of responsibility, disciplinary issues and parents' lack of communication. Measures are being done to correct this, of course, but the parents' enthusiastic response to the Bloomz app has suggested the route this design project has chosen. After the introduction of the virtual classroom app, there is more interaction between the teacher and the parents. Some may openly use the app by asking questions, leaving comments or posting but others will show their presence through the "Viewed By" feature of Bloomz.

This project then proposes that an interactive app with multimedia content can provide a personalized approach, which is also engaging. Even textbooks, such as Bright Sparks (Mathematics) and Bright Ideas (Science), have CD inclusions that allow parents to revise with the children using colorful and interactive tests. The publishers have realized that there is a need to further engage a young child's senses. Getting them involved in the process of learning, through the use of sound and visuals, will make them remember their facts better. After all, "learning engagement, cognitive, and affective involvement of students in learning tasks, can enhance learning achievement. (Bangert-Drowns & Pyke, 2002)" The students should be holistically involved to promote optimal learning.

The Reading Backpack App could have been developed to tackle other subjects, but it will focus on the class's mixed reading abilities. Reading skills, after all, affect the performances in other subjects. There may be other subject tests, such as in Social Studies, that experience low averages (within the 60% to 70% range), but tests have proven that the issue lies more on the reading abilities of the students. Students who do badly when answering structured questions

usually are able to answer when asked orally or when asked through a simpler format, such as multiple choice. The teacher reads the questions and the options. Therefore, it is just easy for the student to circle or shade the letter of the correct answer. Answering in complete sentences is a different issue. The poor readers panic when they see the questions. As poor readers, they barely have the vocabulary, spelling and grammar to support a logical and properly structured response. The extra time and user-friendly setup provided by the app aims to improve reading and the overall performance in other subjects of students who may normally find themselves lagging behind, grade-wise.

The Reading Backpack App designed for the Grade 2 Love class hopes to address the reading level disparity and overall impact of reading comprehension problems. It will do so by providing an after-school app that enables the students to start at their own reading level and to explore reading concepts using the media that they prefer. Kazakoff, et. al (2017) have proven in their study that blended learning in the form of classroom instruction and digital activities enable struggling leaders to close the gap with advanced readers. This is what the Backpack Reading App will attempt to do.

Literature Review

I – Adaptivity and Personalization

"Environments with adaptivity and personalization focus on the process of learning differently. They focus on individual differences of students, and based on certain criteria customize learning to suit individual students. (Kinshuk, 2016)" In this way, the student comes first. The instructor must take a look at the target audience and formulate a learning design instruction that suits that audience, instead of designing a lesson first then finding willing participants.

The first pair of theories considered and incorporated to this project are adaptivity and personalization. The app is meant to provide personalization by its individualized approach on each student. It is also designed to adapt to their responses and pace of learning. Their initial level may have been decided by their face-to-face oral reading tests but their future paths are determined by their learning preferences as they browse the prototype and find textual and multimedia options. Because the Reading Backpack app is designed to meet each child's reading level needs, it responds to what the child needs at the given period of time. The child will feel more confident because he is presented with something he can handle, not something that the class requires for every child.

Why is there a need to go to the technological route if personalization is what is required? Personalization can be in the form of customized lessons, variations in groupings, and mixed pacing. If this is the definition of personalization, then it is something that the Grade 2 Class cannot provide due to its 1:28 teacher to student ratio. Moreover, the class does not have the benefit of a fixed Remedial teacher that can boost individualized instruction. The current Remedial teacher doubles as arts teacher and substitute for the other classes when a teacher is absent. She also focuses on the struggling readers. This continues to limit the advanced readers of the class.

A 2012 research presents an instructional design that makes use of e-books. Huang, et. al (2012) discover that the students' reading accuracy does not necessarily change this way, but the system is able to consistently monitor each child's problem areas. The Reading Backpack App can then complement existing in-class means of progress monitoring. Kazakoff, et. al, (2017), however have witnessed a successful study that is similar to what this design project is

proposing. They have blended digital instruction with face to face learning and have closed the gap among the students' reading abilities.

II – Gagné's Nine Events of Instruction

In 1965, Robert Gagné first published "The Conditions of Learning." In this book, he proposed a systematic instructional design method. This method makes use of clear and elaborate steps that take in consideration how a person learns through how his brain processes external stimuli. It is believed that this method efficiently ensures optimal learning. The nine step method or process becomes well-known as Gagné's Nine Events of Instruction. Below, the nine events have been listed:

1. Catch or gain the learners' attention
2. List the objectives of the lesson to prepare the student
3. Revise prior learning to associate and integrate old and new concepts
4. Present the content through an appropriate medium
5. Guide the students with examples and scenarios
6. Practice with worksheets and drills
7. Give the student feedback to help in correcting errors early
8. Assess or evaluate what has been learned so far
9. Retain the information by applying it on practical or real-life problems

Originally a classroom process, the nine events of instruction is an organized way of preparing and presenting lessons. The first stage, however, takes in consideration the lesson's medium and not just its content and overall execution. The nine events have been considered for this project because one of the main issues is gaining and retaining the attention of a widely academically diverse group of students. A simple reading exercise in school, for example, can

easily attract the attention of advanced readers who love books. It may, however, alienate those who have to sound out every letter just to get through a word.

If the app's methods should be dissected to fit the nine instructional events then it would be in the following manner:

Stage 1: Gagné logically begins his events with gaining the learners' attention. This is necessary to make them focus, watch, listen, and learn. The visual design of the app itself should serve as the first part of the nine events of instruction, which is to gain attention. Sometimes, a teacher can use a clapping sequence or even a song to get the children's attention in a classroom setup. So, far, these strategies are sufficient for most students. Some students would lag behind, unenthusiastically expecting the instruction that is to follow.

Teaching to Generation Z and beyond, however, would require something that could be aligned to their interest in devices. Generation Z students are those that have been born from 1996 to 2010 (Williams, 2015) and those that are born beyond 2010 are being tentatively considered as Generation Alpha (Sterbenz, 2015). These generations have been born into technology, and have seamlessly adapted devices as part of their normal lives. 59% of Generation Z-ers, according to Genota (2018), has ranked YouTube as their most preferred teaching tool. Members of the Generation X and Millennials may have been introduced to technology and have become adept at using it to communicate and learn but they would have typically gravitated towards researching in a brick-and-mortar library when they were younger. Today, students just type in their queries on YouTube's search engine and they get the information that they desire a mere seconds later.

To fully gain and retain their attention, the instructor must be ready to compete against the colorful, audio-enhanced learning environments offered by the World Wide Web and some

downloadable apps. The Backpack Reading App even reduces the time to search for these lessons by embedding YouTube links into its system.

Stage 2: According to Gagné, after the teacher has gained the full attention of his learners, he must now provide the objectives. The objectives are not just provided to make the introductions formal. They can be used to help the students organize and prepare their thoughts. The objectives are also given through the text section of the level (see Figure 2.6). There, it states what the level is focused on, whether it is sounding out letters or comprehending more complex stories.

Driscoll (2014) states that the nine instructional events are happening externally, therefore not inside the learner's mind only. This makes the events more tangible and their roles in facilitating learning more clearer. The app design has the same purpose: to engage the student's attention and keep it. Normally, a way of gaining attention and introducing the objectives would have an instructor greeting the class and explaining what the topic will be for the day. Through the app, the packaging of the lesson is in itself a means to gain attention.

Stage 3: Gagné does not immediately jump to the new lesson. He proposes that instructors revise prior learning to integrate the past lesson with the new one. This also enables the student to recall and reuse skills and concepts that they have already learned. The new lesson is not sprouting out of a vacuum. In the Reading Backpack App, each student has access to his current level and the previous levels. If he needs to recall some concepts from the previous levels, he can choose to go through them again during his free time. The revision does not have to be in order of level. He can choose to focus on the concept that he is still confused about.

Stage 4: This is where a variety of materials can be presented to the students, based on Gagné's nine events. The lesson is presented using various formats: text, video, .pdf book and

games. While there are variations in presenting material in school (text on the board, oral explanation, textbook, handouts and games), the school does not have the budget to provide the classrooms with projectors or smartboards that can provide regular engaging and visually appealing lessons. What the classroom can offer can work well with students who can read in the first place, but there are some struggling readers who are also visual learners. The backpack app aims to address the differences in learning material preferences.

Stage 5: Providing examples and associating the lessons to real-life scenarios is the teacher's role in a classroom. In accordance to Gagné's method, the notes provided to the students always come with examples. Explanations also include updated information from real life. In reading, a way to showcase this is to use texts from other subjects. For example, the class apply Finding Information (a Reading Comprehension skill) on a paragraph about Light and Heat for science. If the text states that "Light and heat are forms of energy" then a possible question that incorporates Finding Information would be "What are two forms of energy?" To connect this to the Reading Backpack app: the app can provide texts that do not just focus on the skills but also teach concepts from other subjects. This will emphasize to the students that reading skills and comprehension can affect the absorption of all other knowledge.

Stage 6: Practice is key to retaining the knowledge provided. Gagné has included this in his process to ensure that concepts are retained. However, with 28 students competing for attention, the educator can only do so much every morning. The reading drills are mostly benefiting confident students who are willing to read with a group, with a pair, and on their own. To attempt to solve this problem beyond the classroom, the app requires the parents to work with their child at least once a week. Hoffman and Nadelson (2017) explain that the pleasurable experience offered by gaming, coupled with the opportunity to gain new knowledge, make

mistakes without repercussions and receive feedback privately, render the Reading Backpack app's games effective means to practice concepts. The games that the students can play on the app should supplement the drills that are done in school but not completely replace them.

Stage 7: Gagné's purpose in providing students' feedback is to allow them to correct mistakes and misconceptions early on. To reflect this desire to correct as early as possible, each prototype level provides a feedback. The level that a child starts with is feedback in itself. It provides him with an idea as to just how far he still has to go to finish his Reading studies for Grade 2. The games and quizzes provide feedback, each of which has positive tones. If the child gets a question right, he gets rewarded. He also gets encouragement if he gets a question wrong.

Stage 8: Students may mistake assessment as simply a means of earning marks. According to Gagné, however, assessments evaluate if learning outcomes have been met. To objectively measure performance, which suggests learning, a form of assessment must be given after every topic.

In the app, Assessment is done at the end of each level through a quiz. The child needs to pass the quiz with a 70% to move on to the next level. If he fails, he will have to go through the lessons of the current level or even revise some concepts from previous levels before attempting the quiz again.

Stage 9: At this point, Gagné is seeking more evidence of sustained learning. The student is expected to generate his own examples, create outlines of the content, and provide their own reference material (Northern Illinois University, Faculty Development and Instructional Design Center, 2019). Retaining is needed to show that real learning has occurred. Providing more content and more games under each level will encourage the students to keep on coming back to the app. Since reading is a skill that cannot be unlearned, unless the brain has been damaged

significantly, then the student can just apply what he or she has learned by reading more stories and books. The app should be able to suggest some links to free stories that are appropriate to the age of the learners. Though it does not require the students to write essays or create outlines, the app is still able to meet Gagné's requirements for transfer and retention. It promotes an environment for repetition, which supports retention of knowledge.

Intended Audience

The intended audience of the prototype is a Grade 2 class (teacher, Remedial teacher and students) in Dominica. The Grade 2 Love class of Convent Preparatory school consists of 28 children, belonging in the 6 to 8 years old age range. The group is generally a mixed group academically. For this paper's purpose, the focus will be on their Language Arts results in class.

The class's Reading Comprehension/Oral Reading/Reading Skills marks are combined. The children have earned a 71.2% or C average as a class. 32.1% (9 children) have earned 85% or higher (As). On the other hand, 17.9% (5 children) have failed the class. The main reason for these failures is the students' inability to read. Therefore, 50% of the class has received marks within the range of Ds to Bs (55 to 84). The other Grade 2 class, with about 50% of the class regularly earning As is more homogenous compared to Grade 2 Love. Grade 2 Love, therefore, needs a personalized and adaptive instructional design more.

The teachers supervising the Language Arts instructions in Grade 2 Love either have an Associate degree or a Bachelor's degree. The Remedial program is present but not sustained due to a lack of staff members. There will be mention of parental involvement in this research, but this is only to provide a description of what has been observed in the students' homes.

Proposed Design

The proposed design for the Reading Backpack App is based on the implementation of the Nine Events of Instructions by Robert Gagné. The image below shows how the app incorporates the nine events into its development.

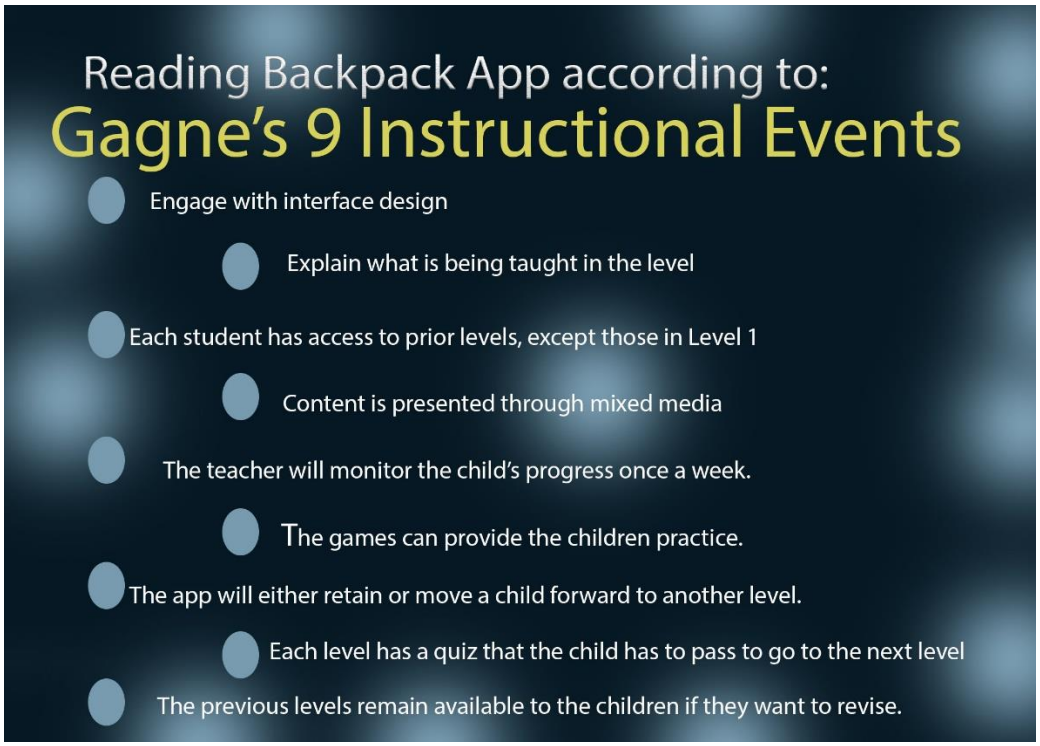


Figure 1 Reading Backpack App according to the 9 Instructional Events

The Reading Progress Backup is primarily intended to help teachers improve their management and teaching of students ages 6 to 8 in a Grade 2 class in Convent Preparatory School in Dominica. This means that it will support an in-classroom system. The students will be able to continue practicing reading concepts at home or whenever they have free time. They can use the app alone or with the support of a parent or guardian. Some children need a little more support than the rest.

The app can be accessed through this link: https://q8bwk3.axshare.com/home.html

Through oral reading tests in the classroom, the current level of reading competence of each child has been established. This is the level that the child will start from in the app. The login page (see Figure 2) will help provide the students the ability-appropriate instruction that they need.

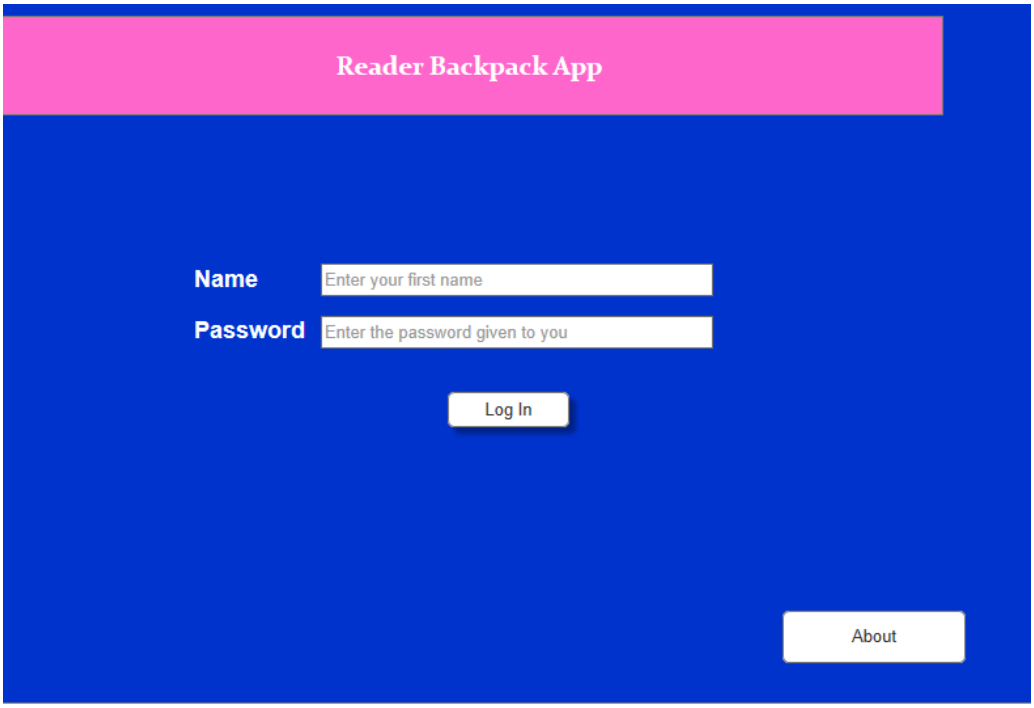


Figure 2 Login Page

Each student will not be able to move on to the next level unless he has mastered the current one he is in. This is why it is important to provide a username and password combination that suits his starting point. The variations can be checked on Appendix C, which also describes the reading ability of each level. For testing purposes, simple username and password combinations have been created. This limits them to the first level of the prototype, which encourages them to work hard to pass the end of level quiz. Passing the end of level quiz is the

only way to move on to the next level, without the availability of the other username and password combinations. The drive to move on to the next game level is part of the pleasure of digital learning through games, according to Hoffman and Nadelson (2017).

The level each child has reached should be noted by the teacher every end of the week. The teacher will also note if all the students are actively making use of the app and if there are improvements in the reading of the students that were initially having difficulty.

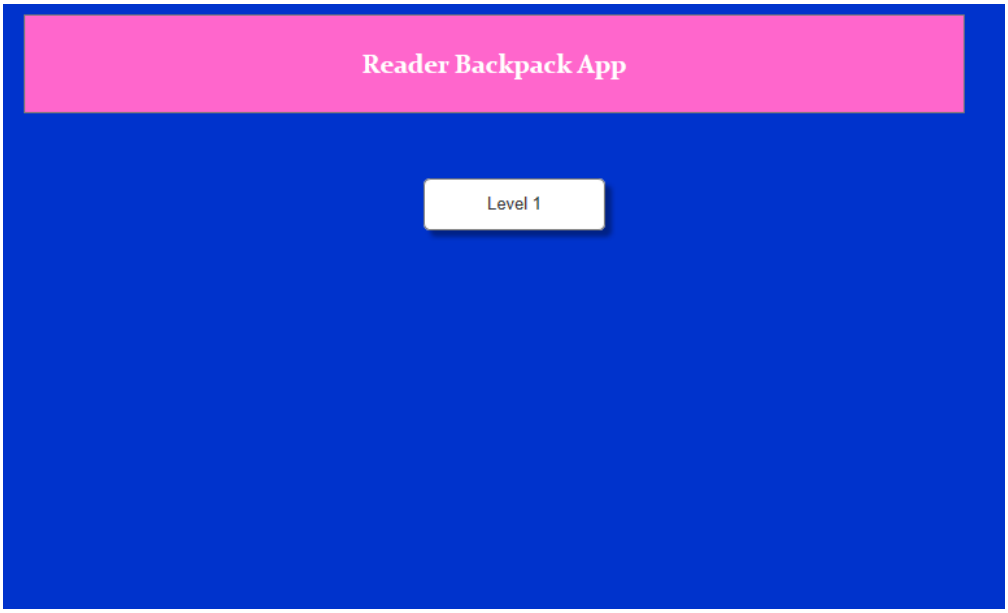


Figure 3 Level 1 Main Menu

Figure 3 shows the main menu of the prototype, at Level 1. A level 5 child will be seeing Figure 4, instead. He or she has more access and can choose to start at any level if revisions are deemed important at any given point.

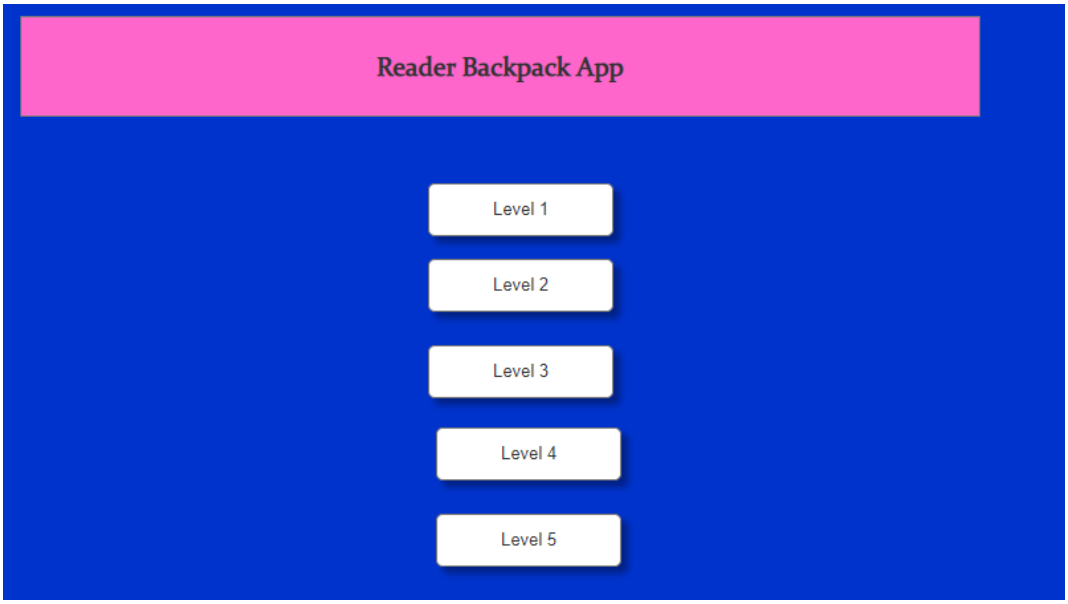


Figure 4 Level5 Main Menu

When accessing the level the child is assigned to, if the wrong username and password combination is entered then an error message will show up, prompting the user to enter the correct combination (see Figure 5). Only when the correct combination is entered can the user be able to explore the initial recommended level. The username and password combination ensures that the student enters the level that is best suited to his reading skills. This is important in personalizing the student's path within the app.

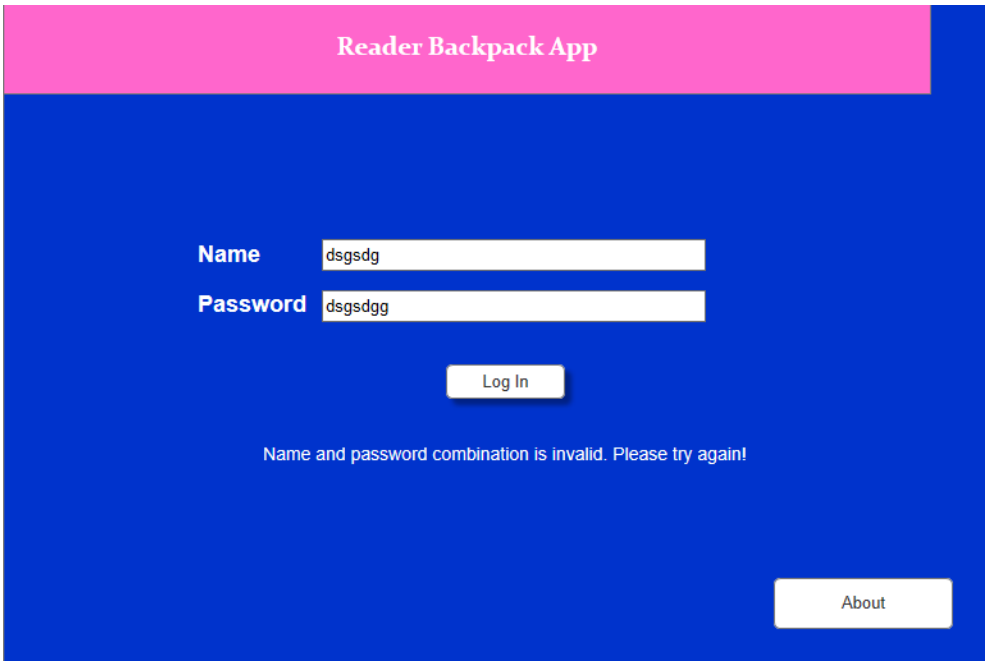


Figure 5 Error Message

A game page, text page, audio visual page and quiz page have been provided as options. Each of these pages have options, which are at the moment, limited. These options, which serve as the library of information that the child can go through to better understand the reading lessons, can be seen as Figures 6, 7 and 8. There are four buttons each, but these can be expanded later.

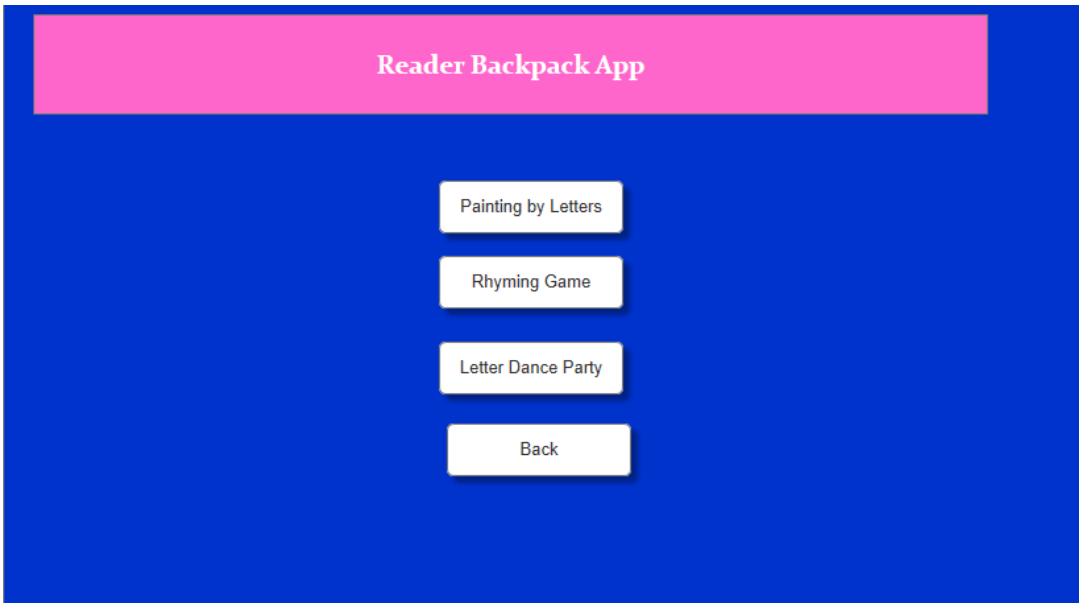


Figure 6 Games Menu (Level 1)

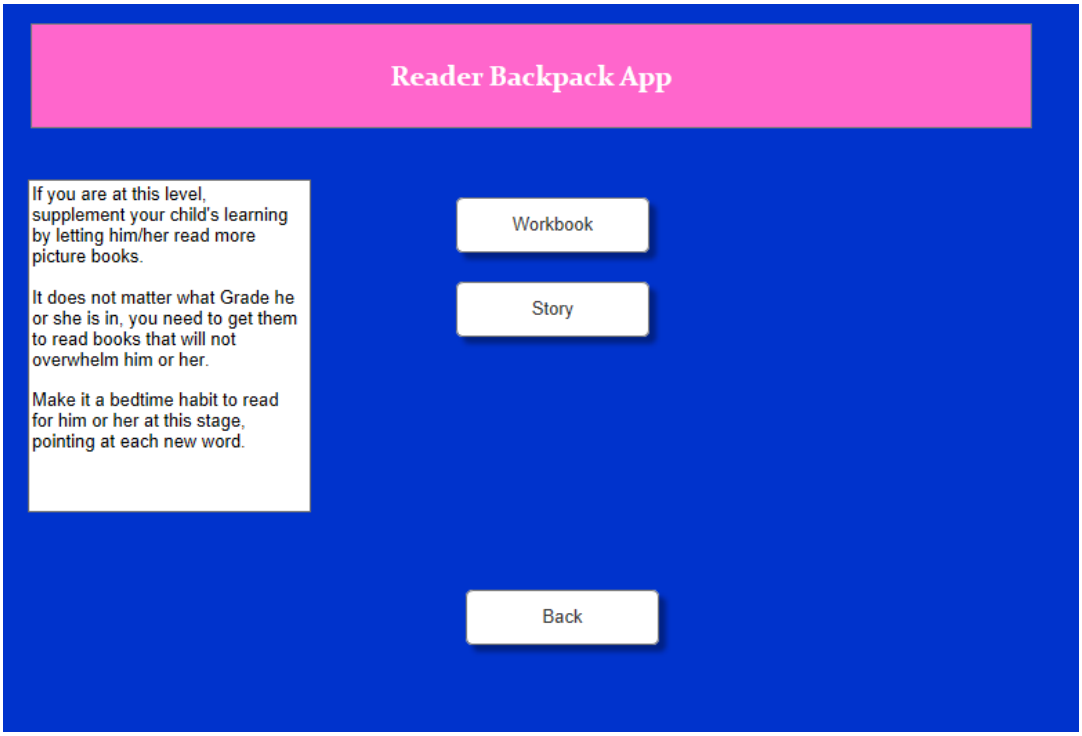


Figure 7 Text-Based Learning Menu (Level 1)

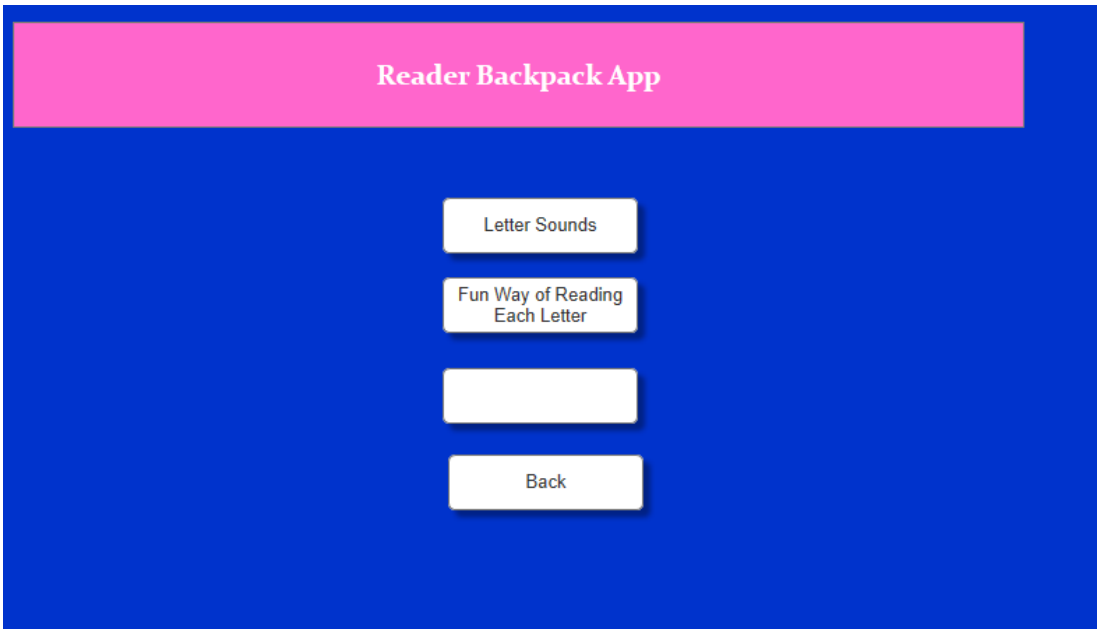


Figure 8 Video Menu (Level 1)

Each level has something similar: a games, audio visual, and text page but the content is different and more suitable to the particular level. To better illustrate this, here is the Games page for Level 5:

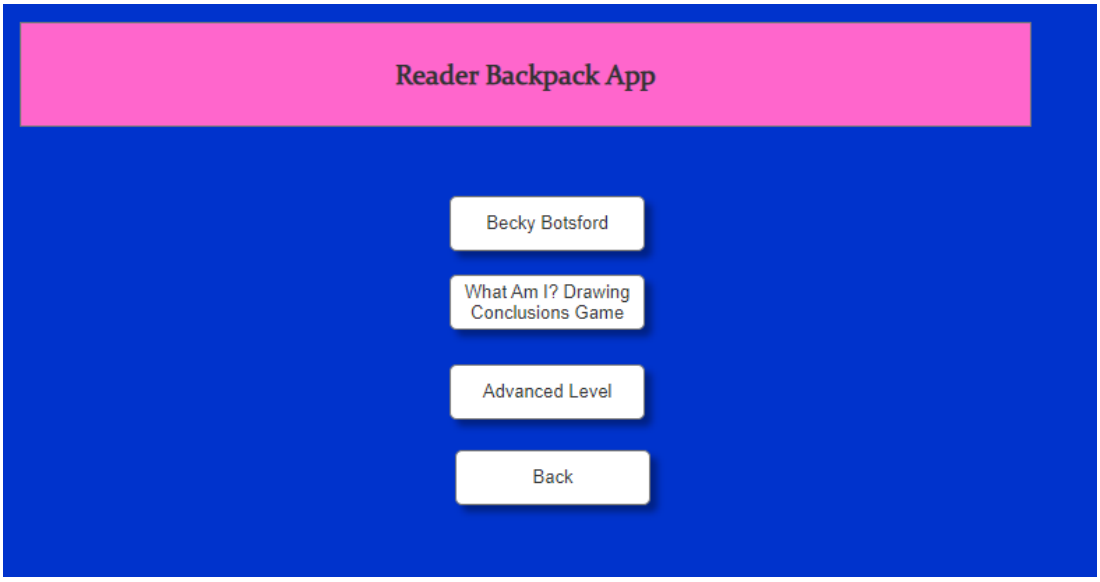


Figure 9 Games Menu (Level 5)

The user has the option to either just play games, read texts about the lesson or watch videos that teach the topic. He or she is not compelled to complete all of the options. On the other hand, the student can also utilize all the learning preference options. This freedom can be explained through the discussion of Trespalacios, et. al (2011), who have concluded that 21st century students prefer learning via video games, but that not all video games are suited for all types of learners. There is also a need to recall the fact that the proposed instructional design aims to apply personalization into Grade 2 Love's reading program. Furthermore, Bray & McClaskey (2019) have specified that in a personalized learning environment, the students get to select appropriate resources that can aid them in learning.

After utilizing the preferred learning resources, the student can then take the quiz whenever ready.

Figure 10 Quiz Page 1 Level 1

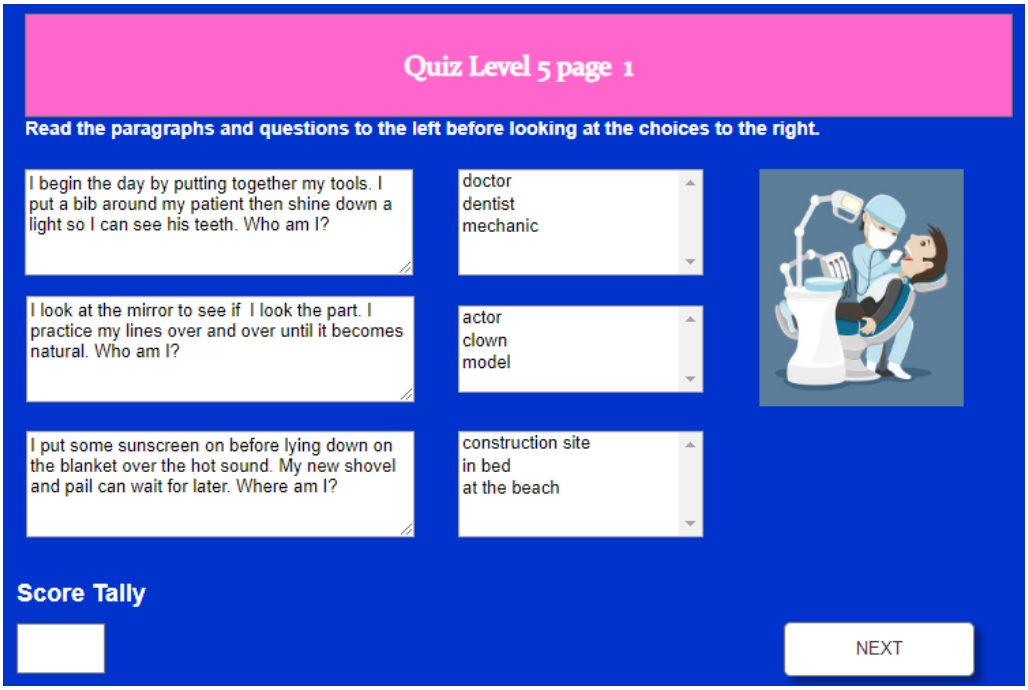


Figure 11 Quiz Level 5 Page 1

The answer options are given in through a clickable menu. Once the answer has been pressed, a counter is activated. If the answer is correct then the counter will display one additional point in the Score Tally box. Otherwise, no point will be awarded.

The quiz is the user's only key towards the next level. Each has been originally created for the app. Children who begin from the very last level have the option to visit all the levels if they feel going through those levels will improve their understanding. The increase in levels even in the quizzes provided can be made evident through a comparison between Figures 10 and 11.

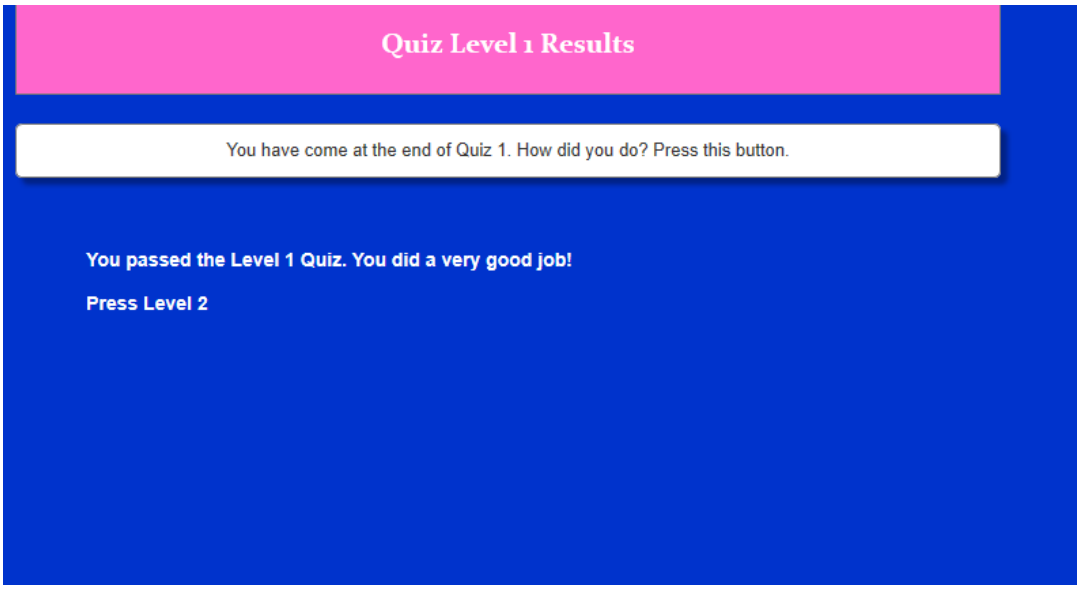


Figure 12 Quiz Level 1 Results

The Reading levels that the students are being tested on can be found on Appendix A.2.

Review of Design

Methodology

The research is conducted using mixed qualitative and quantitative methods, although it depends more on a largely quantitative questionnaire. There are also questions that require qualitative answers and some oral feedback have been considered. The full questionnaire can be found under Appendix C.

The live testing with the Remedial teacher has been conducted within the classroom setting while the rest of the students continue working on the subject in their timetable.

Methods and Procedures

The design was tested by sending the link of the prototype to the Grade 2 Love parents via Bloomz. The principal, Remedial teacher and another teacher had been personally requested to take part in the testing to ensure the appropriateness of the content and learning levels of the prototype. The principal first tested the app and had provided permission for the testing to proceed. She was not provided with a questionnaire. However, the Remedial teacher was requested to observe students who were testing the prototype live and comment on its effectiveness as a supplementary solution. Another teacher tested the prototype on her own and answered the version of the questionnaire found on:
https://www.surveymonkey.com/r/NPSDW72

Parents were asked to personally and voluntarily sign up their children for the testing. The testing was directed towards the students but the parents did the signing up for them. This was based on how the Office of Educational Technology (2019) cited that learning through technology is more effective when the child co-views with an adult or a peer. This setup also provided a check on some children who may passively, instead of actively use the prototype. In

the case of Grade 2 Love, two to three children needed to be read to so that they could effectively get around the app. Because of this, the parents were the ones that have been provided with username and password combinations, as stipulated in Appendix C. General invitations to the parents, on behalf of their children, had been posted on Bloomz. The correspondence and updates can be viewed under Appendix F.

The researcher was left with a sample size of 20 because the invitation had been made through Bloomz. The responses were varied, depending on the parents' desired means of communicating. A printed questionnaire was given to all participating children for their parents to help them with but only a small percentage managed to be returned promptly with a response. For some who have lost the printed questionnaire, the Survey Monkey link has been provided: https://www.surveymonkey.com/r/R3RL9FX.

Sample and Sampling Method

It is a small research so it was deemed best to get as many of the total population as possible to test the prototype and respond to the questionnaire.

Research Instrument 1: The Questionnaire

The paper-based questionnaire consists of 12 questions total. The first ten questions follow a Likert scale of 1 to 5, with 1 being "Strongly Disagree" and 5 being "Strongly Agree". 4 and 5 responses are considered positive since all the statements are positive statements that favor the proposed design. 3 is considered Neutral, while 1 and 2 are negative responses. The other two questions make way for positive feedback/commendations and criticisms/recommendations.

A slightly different questionnaire has been given to a teacher who also teaches Grade 2 Love and who has served as substitute for the class whenever the Grade 2 Love class teacher is absent.

Research Instrument 2: Interviews with the Children

A few students were handpicked to test the prototype live. Convenience sampling had been applied because of the time constraint and the need to choose at least one child at Level 5 and another child at Level 1 to compare and contrast their reactions to the prototype. They each worked on the level that they have been assigned to. They were allowed to dictate what buttons to click. The buttons would lead them to the games, videos or text that they felt would help them learn the concepts better. The prototype was tested on a mobile phone, because it was the least likely to provide a convenient and user-friendly environment. In other words, the students should be seeing the most problematic aspects of the prototype. Afterwards, questions were asked regarding their preferences in learning.

Research Instrument 3: Interview/Observation with Remedial Teacher

The Remedial teacher used the prototype during her free time with two of the children from Grade 2 Love. These two children are each at the end of the Reading level range (Level 1 and Level 5). While both children were engrossed in using the app, each had encountered some issues that prevented them from fully enjoying their experience.

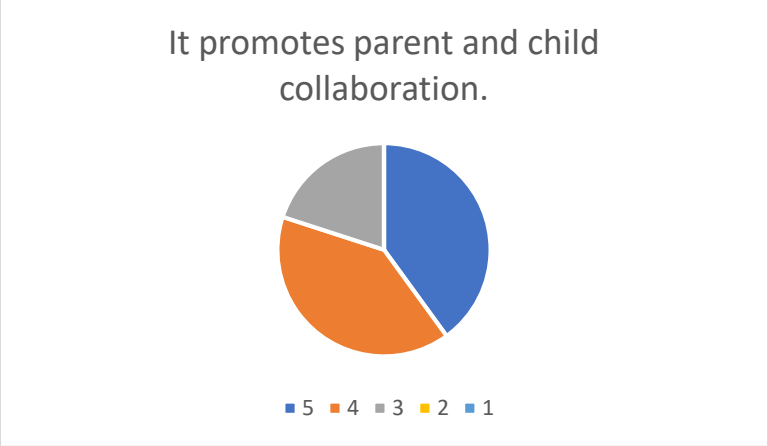
The Level 5 student was able to explore the prototype easily. However, she had issues with some of the tabs opening and had to be assisted. There were some games that were too big to be fully accommodated on the mobile phone, although they were more user-friendly on a tablet. The student enjoyed the games and declared that she had learned something from that short period of time. However, the Remedial teacher observed that she was growing impatient when she encountered a longer than usual game. She preferred the quiz's 10-item format.

The Level 1 student took awhile to find an activity to latch on to. He was pressing several buttons in a trial and error way. The Remedial teacher said that she let him explore first, but could see that he needed some assistance. He still struggled with reading and depended on visual and auditory cues. He wanted to turn the volume up so that he could hear the instructions for the games. This student was particularly difficult to engage in any subject but he continued to work on the prototype even after the bell had already rang for recess.

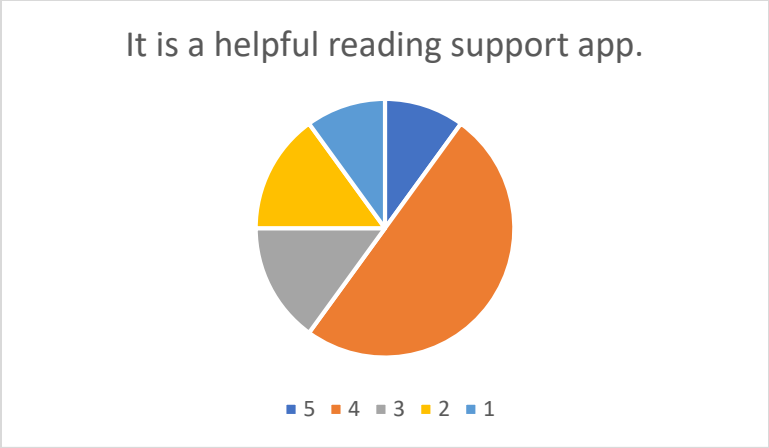
Presentation of Findings

Charts

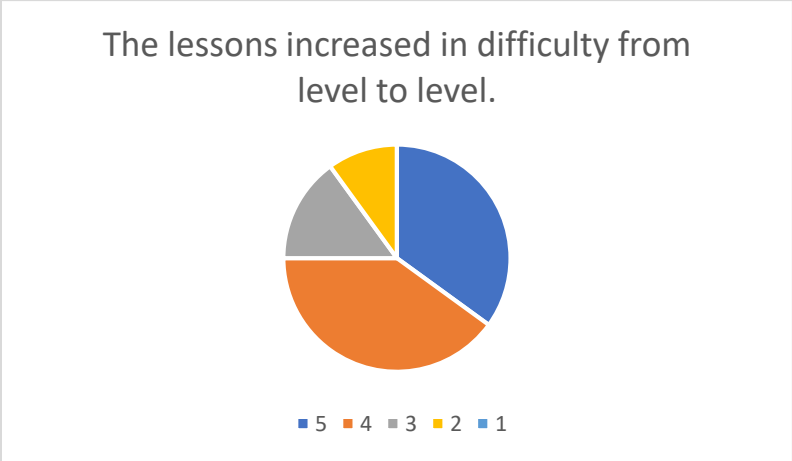
Here are some of the results of the survey given to the parents.



While an answer of 3 and higher is still largely positive, there is a tinge of uncertainty in the responses. With 40% strongly agreeing and another 40% agreeing, most parents do recognize that they are needed to help their child go through the levels together.



The app as a helpful reading support has mixed reviews. Because the app has not been incorporated to the students' school work, it is also not easy to assess if the app has done anything extra for them. In class, it usually takes a whole term before a child's oral reading can be formally assessed again.



As with the previous pie chart, this pie chart reveals some disagreement to the statement. 10% of the parents disagree that the lessons increased in difficulty from level to level. This may be caused by either students having difficulty throughout or having a very easy time with all the levels.

The results for the above questions best

Criticisms

- I can barely play the prototype on my device.
- More videos and content would be preferable.
- The prototype does not display the way I would like to see it on my screen.
- The prototype opens tabs to redirect to third party links. I prefer that the games can be played on the same window.

Positive Feedback

- The content is appropriate to the age group.
- It encourages reading while using a device.
- It appeals to young children.
- I would like to see it developed into an app.
- I got everything correct in the level. I enjoyed it myself.
- It is really interesting. My son liked it.

As a whole, the data collected suggests that many of the parents are willing to incorporate a potential app into the children's Reading classes.

Analysis of Data (Based on the Three Instruments)

Most of the data was acquired through quantitative means, which made it easy to tally the marks. The parents had to choose a rating from 1 to 5, with 1 representing Strongly Disagree and 5 representing Strongly Agree.

Below are the statements that the parents have to respond to after they have gone through the testing stage.

I would like a fully developed version of this app.
It promotes parent and child collaboration.
Users will be able to learn to use it very quickly.
The theme was consistent all throughout.
It is free of errors.
It is a helpful reading support app.
The quizzes were reasonable for their levels.
The lessons increased in difficulty from level to level.
The progression makes sense.
I can comfortably play it on my device.

Based on the reported questionnaire results (see Appendix E), the app's testing was generally successful. Most of the students, with the aid of their parents, were enthusiastic about the app. However, there were some issues in terms of being able to comfortably use the app in their devices. Those who had used their computers and tablets had a better experience compared to those who used mobile devices. Wi-Fi and mobile connection had been an issue with at least three parents.

The teacher who answered the survey thought that the levels and teaching progression were appropriate for the class. She, however, believed that the prototype should present more original content to sustain the attention and dedication of students. Her detailed responses could be found on Appendix E.

The quantitative results were not enough to create a more tangible picture of the students' experience with the prototype; some qualitative research instruments were also used. "Qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (Aspers, 2019). Therefore, the students had to be observed within the confines of the classroom, as well. The project then proceeded with interviews of students who are in the act of using the prototype. The children were testing and answering within the classroom that serves as their natural learning setting.

The students who were involved in the observation testing enjoyed the games the most and gravitated to the games section. The Level 1 child did not like the idea of adding more text content to the app, while the Level 5 child preferred the quiz part of the level. Despite this, all the children who tested the prototype live, as well as the children who merely watched at the back, are interested in learning reading through the use of a technological device. Each child did not want to stop using the prototype, until told that his/her time was already up.

The detailed report on the children's responses to the questions asked after the testing can be found on Appendix G.

The Remedial teacher was also consulted regarding the usefulness of the prototype. After an observation period with two student at opposite ends in the reading abilities spectrum, she concluded that the app had the potential to become an effective teaching tool. The students were engaged and interested in learning through games and videos. They enjoyed the short 10-item

quiz and the quick feedback and scoring. However, she observed and recommended the following.

- The prototype can be optimally used on tablets and laptops. It should be adjusted for mobile phones.
- The students may need parental support at varying levels: about 80% to 100% presence for Level 1 students to 20% or enough time to explain the instructions and what to expect with Level 5 students.
- Using a phone is possible but the students may need help with the opening and closing of extra tabs.
- Sound should be at a suitable volume so that lower level students can listen, instead of just reading, instructions.
- Games should have fewer questions because the students become agitated when a game goes on and on, without an end in sight. They want quick feedback.

Modifications to Design

Some alternative changes that can be applied to the project based on the respondents' feedback and criticism are the following:

a) Tiered Learning Targets

The testing is implemented without a target for each child. For example, some children start from the very last level. The levels had been determined based on their in-class oral reading exam averages. They should either have been given more work to do or given supplementary work or even a finishing deadline. Those who begin with the very first level are not expected to finish a level fast. The first few levels should be the

most difficult to tackle because the students who have been assigned them are still trying to learn how to sound out letters and put together letters. If, however, a Level 5 child decides to take on all the levels, then he or she is expected to breeze through all of them. Such a student may already be on the 9th event of instruction by Gagné: he/she is using the prototype to retain information.

b) Practice Quizzes

Each level currently has a quiz with 10 questions to facilitate quick results and fast evaluation by testers. Practice quizzes can be added to provide more regular feedback that can drill the students for the end-of-level test.

c) Device-Friendly and Budget-Friendly, Original Videos

The researcher plans to provide original videos to future iterations of the prototype. This way, there will be better control in terms of specifications design: video file size and formatting. In-house videos can also be embedded onto the app's pages, therefore not depending on new open tabs to play.

Discussion and Conclusion

Reading at varied levels and paces can be a problem for a mixed-abilities, packed class, such as Grade 2 Love. This is why the Reading Backpack App came into fruition. The idea is to provide students with different reading abilities their respective, appropriate learning environment. Within such an environment, the student is made to focus on the concepts that he or she needs to master before being able to tackle the next level. It can be argued that it is easy for the average parent to search YouTube videos to teach their children with on their own, even without the prototype present. However, the prototype connects varying media that teach similar concepts in one handy app, encapsulated in one device. The instructor-researcher also serves as

the curator of information that can be utilized into instruction because it should be noted that while there may be billions of YouTube videos online, most of them are of poor quality (Henriksen, et. al, 2016). The very bulk of the database makes it easy for content to be fabricated and/or to be mediocre. Moreover, Murray and Olcese (2011) opined that while learning materials via digital media are readily available, the strategies have not been diverse. Apps that may exist in the market may not be suitable to a particular class, for example. Most of these apps make use of the behaviorist theory of instruction, specifically on conditioning. Gagné's Nine Events of Instruction lean towards behaviorism. However, the app has also a "soul" that goes beyond displaying the results of external stimuli. This is in the form of personalization and adaptivity.

Unfortunately, personalization takes a significant amount of time to design for such an app that the videos and games had to come from third party providers at this point. The researcher believes that the students should be provided with different media to cater to their 21st century learning preferences but developing media, such as videos and games, take time. A game in itself requires a team of illustrators, programmers and concept designers. A compelling video requires a good quality camera and some video editing. Therefore, the researcher instead personally curated the games, videos and stories that were to be included into each level. Each of these third party content were viewed and reviewed to see if it is appropriate in terms of content and reading level. The quizzes are original and are based on the reading levels.

The Reading Backpack App does not aim to be the sole provider of Reading lessons for Grade 2 Love. It will be, instead, supplementary to the existing traditional classroom setting and the Remedial support that only a few of the children receive. It has its limitations, but it does succeed in some ways:

One, Gagné's First Event is incorporated into the app in such a way that even the most apathetic student has responded to it. A format with colors, sounds and movement has been effective in getting the children engaged in a reading lesson.

Two, parental engagement has been encouraged. While the parents are not the direct targets of this app, the Office of Educational Technology (2019) promotes the shared use of technology between parent and child. In this supportive format, learning becomes more effective. Parent-child interaction is made possible at the very least. Because the Internet is involved, it is also wiser to have some parental guidance. The question of whether to use technology to teach is already leaning towards the positive now. However, Halaweh (2017) reminds parents and teachers of the problems of regulating its use. Students should and could study with the use of their devices, but the usage should be regulated to ensure that what they are doing is related to their work.

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Appendices

Appendix A – Reading Levels

A.1 – Testing Methods in the Roseau Grade 2 Class

- Oral reading tests – a more direct approach
    - Sounding out letters
    - Combining blends and digraphs
    - Matching words with pictures
    - Reading individual words previously given as spelling words
    - Reading a full paragraph
    - Answering questions about the paragraph
- Group and individual reading aloud sessions
    - The instructor reads first.
    - The class reads together with the teacher.
    - Some volunteers can read on their own.
    - Some chosen students will have to read on their own.
    - Struggling students are given time to practice read with the teacher.
    - Problem readers are given Remedial Reading time once a week.
- Lessons, especially in Phonics, Reading Comprehension, Spelling, Reading Skills
    - Introduction with games and other ice breakers
    - Discussion
    - Examples
    - Exercises (guided and independent work)

- Notes
- Homework/Assignments

A.2 Identified Reading Levels

The levels that Grade 2 in Convent Prep make use of are the following:

- 1 – Sounding Out Letters
  - Lessons: Alphabet, Alphabet Sounds, Blends, Digraphs, etc.
- 2 – Pointing at/Choosing Correct Pictures
  - Identifying pictures, Finding clues in the letters
- 3 – Reading Single Words
  - Vowel Sounds, Consonant Sounds, Spelling Words (weekly dose of 15 words)
- 4 – Reading a Story (This level can also have 3 stages: beginner/K level, Grade 1 level, Grade 2 level)
  - The lessons may include stories with pictures and audio that the students can follow.
- 5 – Comprehension
  - Finding Information, Main Idea, Sequencing, Drawing Conclusions, Inferring, etc.

After the student's initial level is determined and encoded into the app's database, the student will be asked if he wants to proceed with that level or go to an earlier level (if applicable) to learn and revise. The content provided are in various formats, such as pure text, text with graphics and audio-visual. The student can select the lesson format of his preference. He can also go through all formats if he needs to.

A.3 Actual Sample Oral Reading Test

Name: _____

Grade Two (2) May 2018

Oral Reading Test

Section A *(5 marks)*

Look at the underlined letters. What sound are they making?

1. m**oo**se ___
2. c**oi**n ____
3. cr**ie**d ____
4. str**aw** ____
5. no**tion** ____

Section B *(9 marks)*

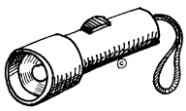
Say the words below.

1. redo ____
2. joyful ____
3. mishandle ____
4. curly ____
5. resources ____
6. occupation _____
7. adjective ____
8. tiniest ____
9. preview ____

Section C *(5 marks)*

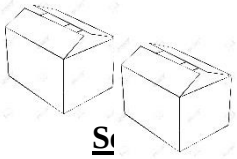
Point to the word that names each picture.

candy
candle

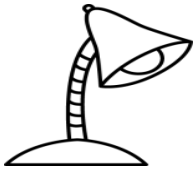


Flush
Torch

Shark
Shook



Boxes
Boxed



Lamp
Lump

S

Read the passage carefully.

Expression (3)	Punctuation (3)	Word Recognition (3)	Overall Fluency (3)	Clarity of reading (3)	Question (1)	TOTAL (16)

One hot day a parrot was very thirsty. She was looking for water to drink. At last, she found an old tin with a little water in it. The tin was deep. The parrot could not reach the water. She tried many times but still could not reach the water. Finally, the clever parrot had an idea. She flew away and picked up little stones. She dropped the stones, one by one, into the tin. The water got higher and higher. Now the parrot was no longer thirsty.

Recording errors:

word - repetition

~~word~~ – substitution

^word - insertion

word – omission

word – unknown word(supplied by teacher)

word. Word – omitted punctuation

word // word – hesitation longer than 5 seconds

word/word/word – counting words

Summarize why the parrot dropped the stones into the tin.

*(*teacher will write student's response)*

_____

_____

- **Good Response** *(Shows understanding of information from the passage)*
- **Fair Response** *(Shows limited understanding of information from the passage)*
- **Poor Response** *(Shows lack of understanding or misunderstanding of information from the passage)*

Student Copy

Section A

Look at the underlined letters. What sound are they making?

1. m**oo**se ___
2. c**oi**n ____
3. cr**ie**d ____
4. str**aw** ____
5. no**tion** ____

Section B

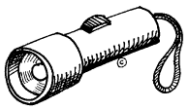
Say the words below.

1. redo ____
2. joyful ____
3. mishandle ____
4. curly ____
5. resources ____
6. occupation _____
7. adjective ____
8. tiniest ____
9. preview ____

Section C

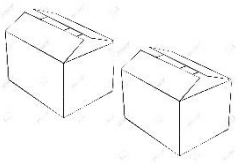
Point to the picture each word names.

candy
candle



Flush
Torch

Shark
Shook



Boxes
Boxed

Lamp
Lump

Section D

Read the passage carefully.

One hot day a parrot was very thirsty. She was looking for water to drink. At last, she found an old tin with a little water in it. The tin was deep. The parrot could not reach the water. She tried many times but still could not reach the water. Finally, the clever parrot had an idea. She flew away and picked up little stones. She dropped the stones, one by one, into the tin. The water got higher and higher. Now the parrot was no longer thirsty.

Summarize why the parrot dropped the stones into the tin.

Appendix B – Screenshots of Prototype

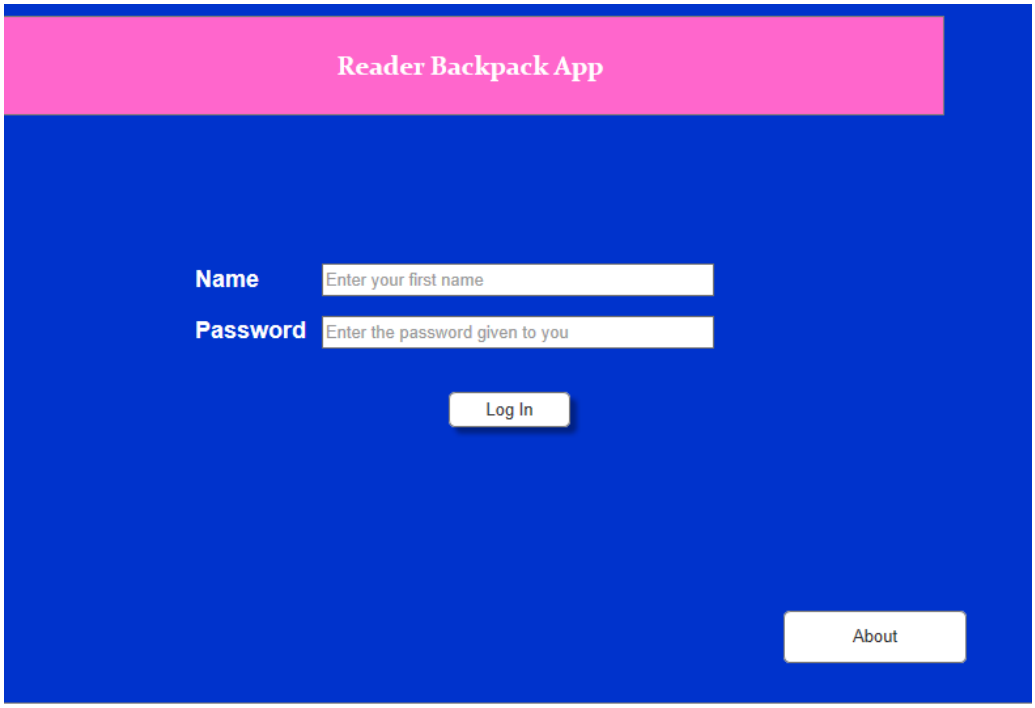


Figure 2.1

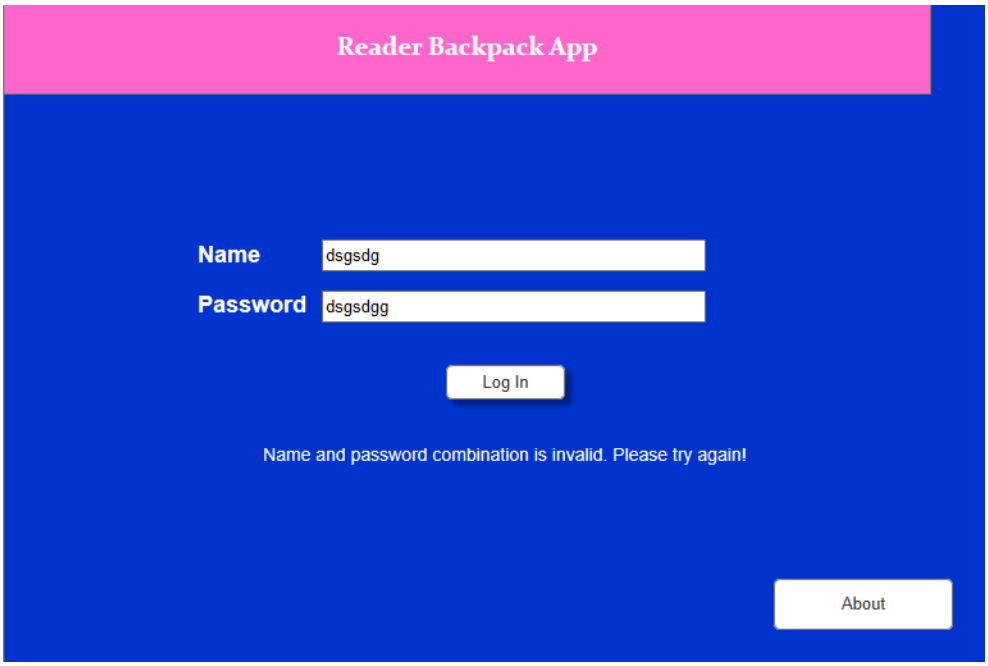


Figure 2.2

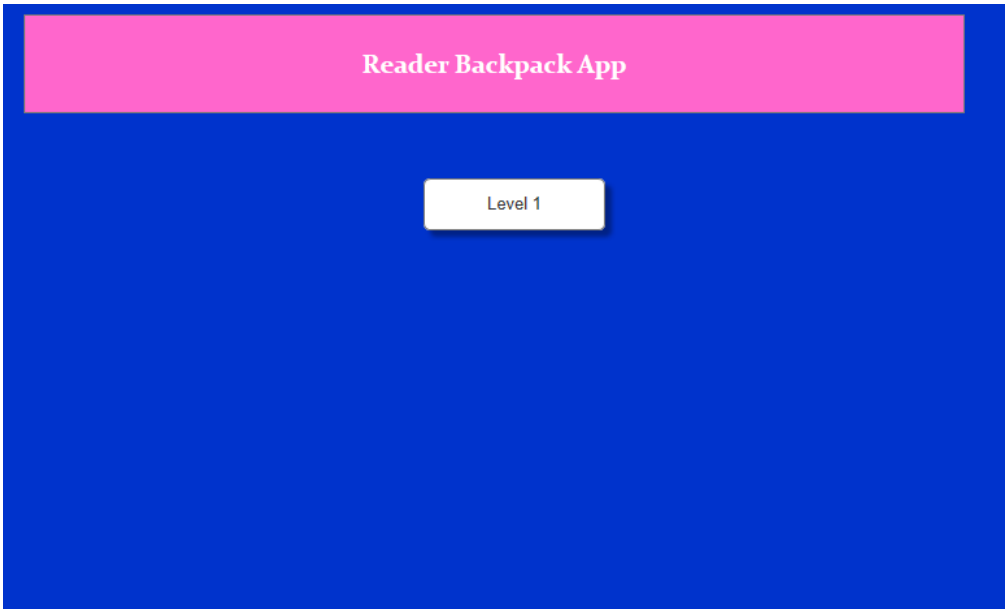


Figure 1.3

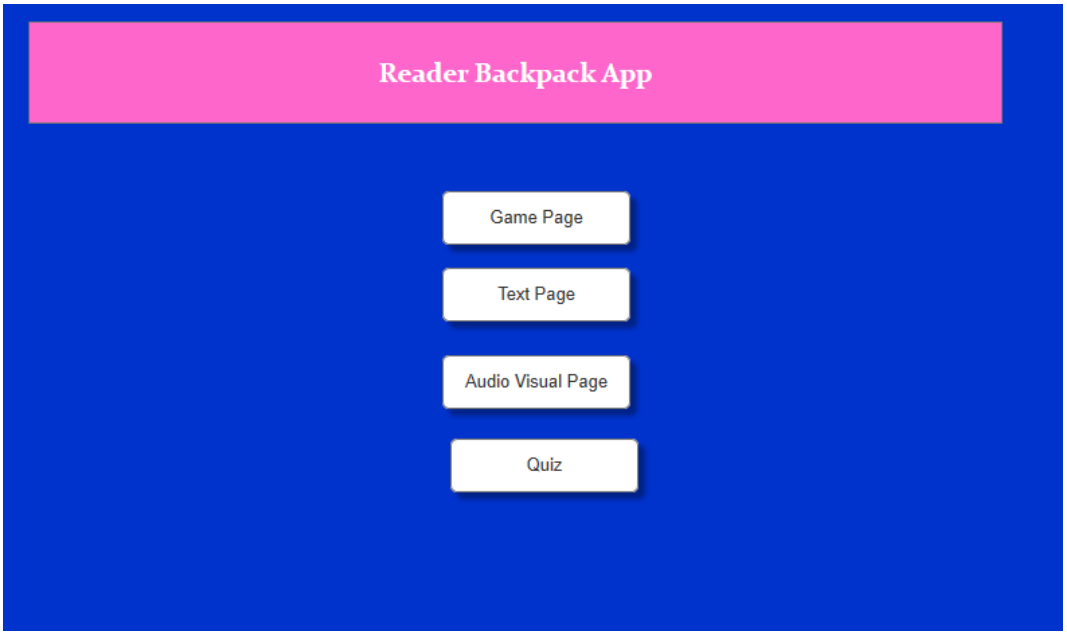


Figure 2.4

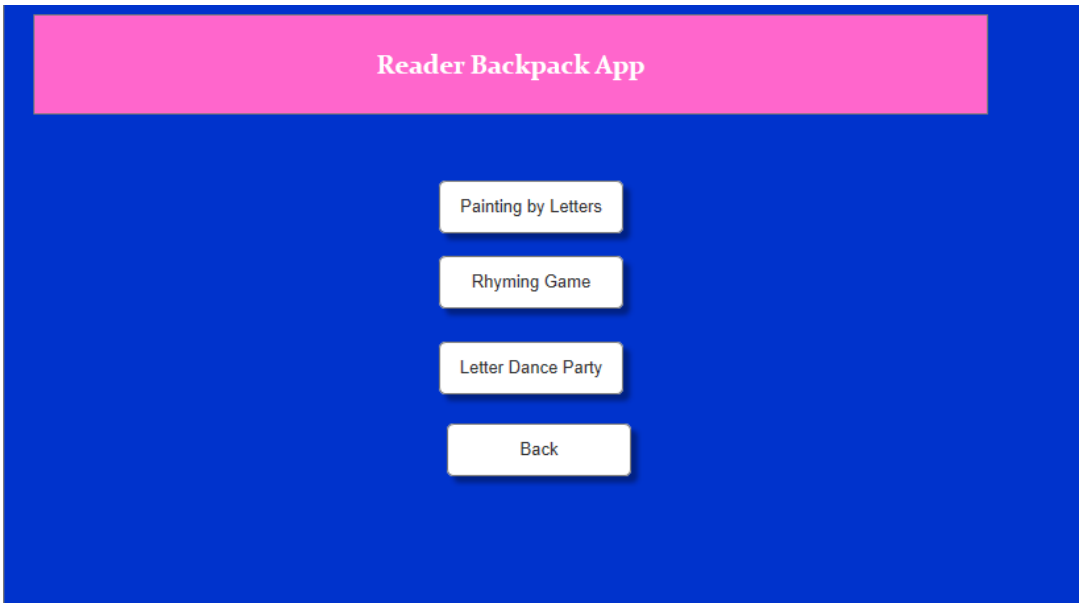


Figure 2.5

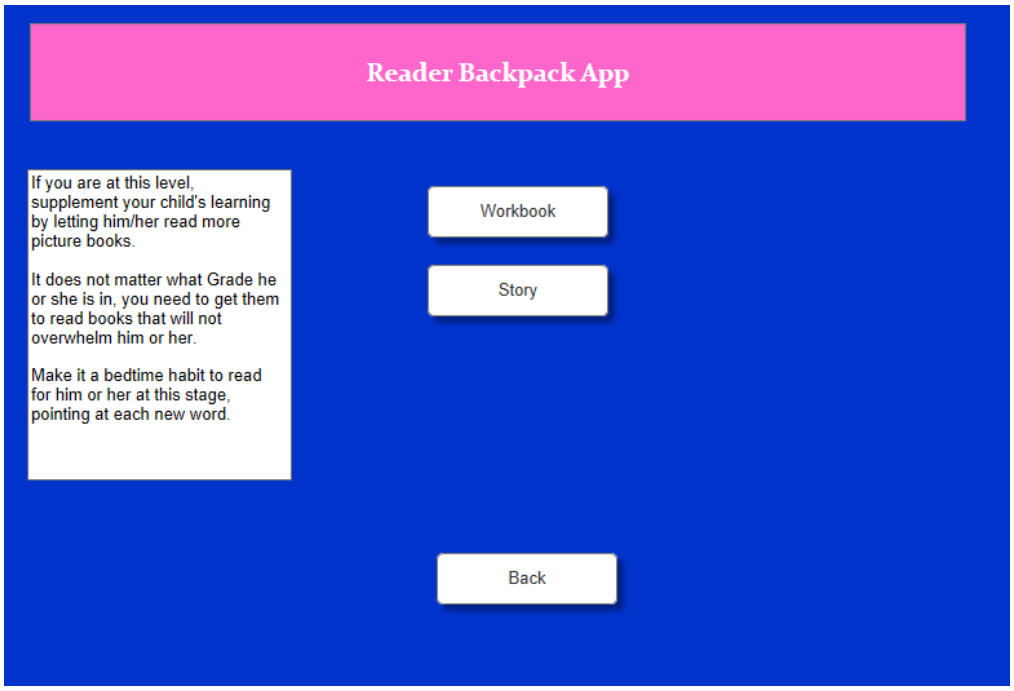


Figure 2.6

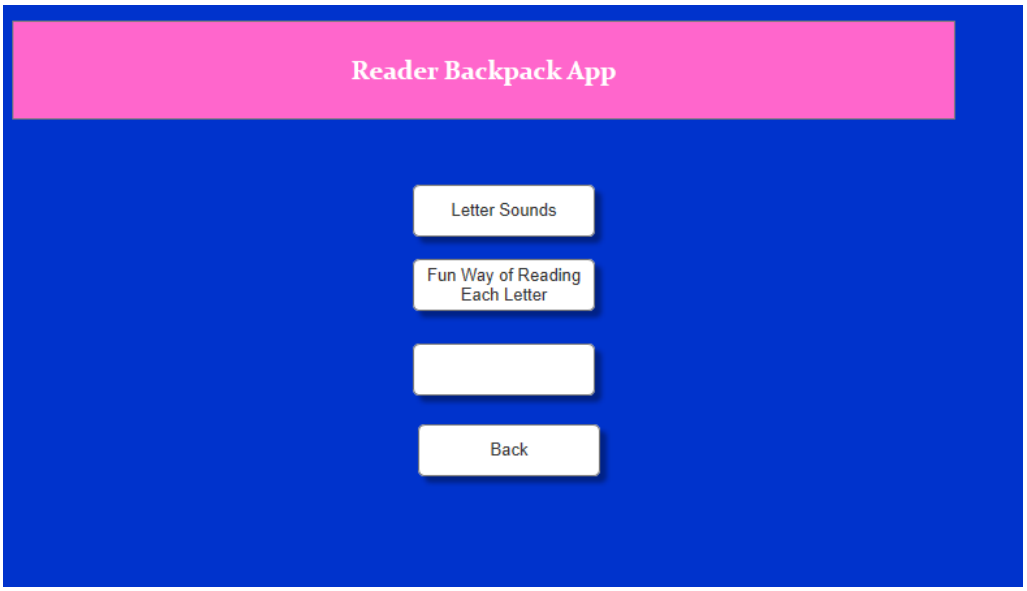


Figure 2.7

Figure 2.8

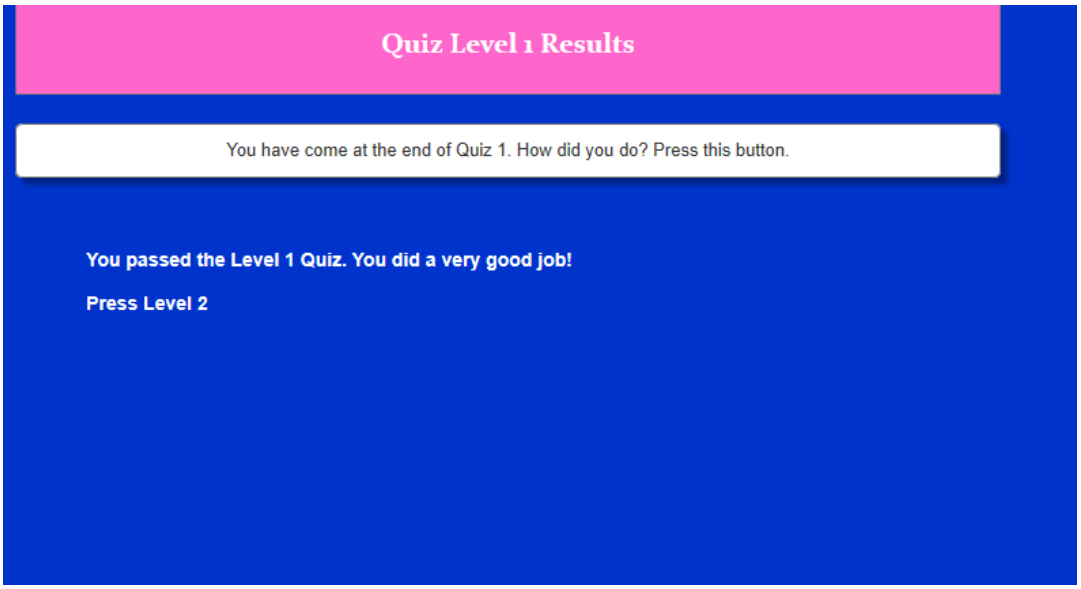


Figure 2.9

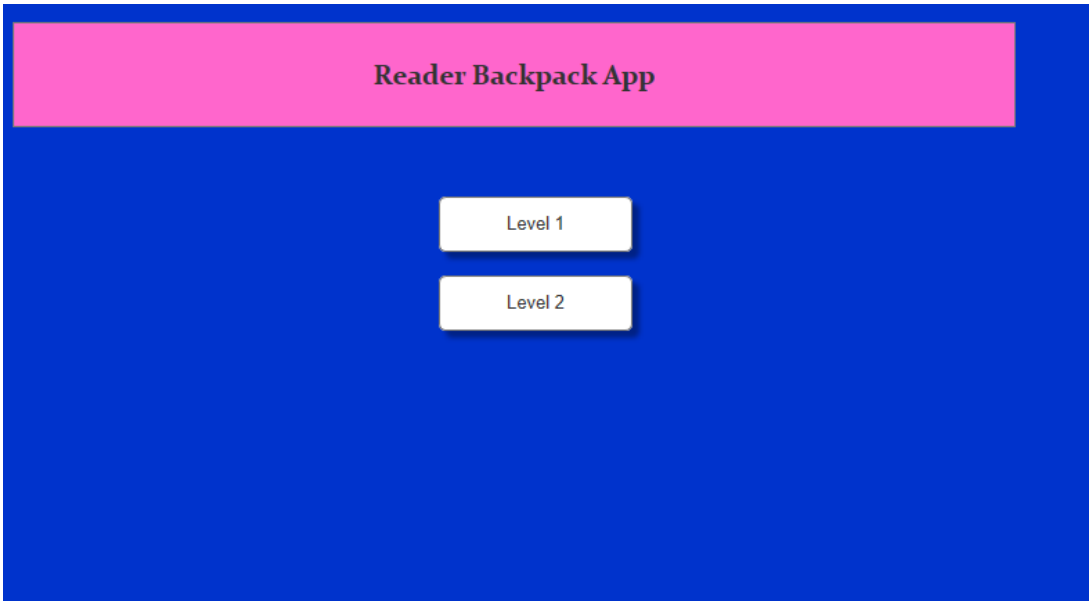


Figure 2.10

Appendix C – Username and Password Combinations Used

Level 1 – For children who are still sounding out letters and blends

Username: level1 Password: level1pass

Level 2 – For children who can read mostly sight words

Username: level2 Password: level2pass

Level 3 – For children who read but do so very slowly

Username: level3 Password: level3pass

Level 4 – For children who can read but may have issues with comprehension

Username: level4 Password: level4pass

Level 5 – For advanced readers

Username: level5 Password: level5pass

Appendix D – Survey Questionnaires

Name of Child: _____ Level Started: _____ Parent/Guardian

_____

The System Usability Scale Standard Version

(from 1 Strongly disagree to 5 Strongly Agree)

#	Statements	Comments	1	2	3	4	5
1	I would like a fully developed version of this app.						
2	It promotes parent and child collaboration.						
3	Users will be able to learn to use it very quickly.						
4	The theme was consistent all throughout.						
5	It is free of errors.						
6	It is a helpful reading support app.						
7	The quizzes were reasonable for their levels.						
8	The lessons increased in difficulty from level to level.						
9	The progression makes sense.						
10	I can comfortably play it on my device.						

Commendations (Positive Remarks):

_____

_____

_____

_____

Recommendations and Criticisms (what to Improve)

_____

_____

_____

_____

The online links are not original. What type of content would you like to see if the app becomes fully-developed?

1. _____
2. _____
3. _____
4. _____
5. _____

Thank you very much for your feedback,

Jabel Erica Odiamar-Bercasio

MsC Instructional Design and Technology

University of the West Indies – Open Campus

Teacher's Name: _____(optional)

The System Usability Scale Standard Version

(from 1 Strongly disagree to 5 Strongly Agree)

#	Statements	Comments	1	2	3	4	5
1	I would like a fully developed version of this app.						
2	It promotes parent and child collaboration.						
3	Users will be able to learn to use it very quickly.						
4	The objectives to each lesson are clear.						
5	It is clear what concepts are being highlighted by the level.						
6	It is a helpful reading support app.						
7	The quizzes were reasonable for their levels.						
8	The lessons increased in difficulty from level to level.						
9	The progression makes sense.						
10	I can comfortably play it on my device.						

Commendations (Positive Remarks):

_____

_____

_____

_____

Recommendations and Criticisms (what to Improve)

_____

_____

_____

_____

The online links are not original. What type of content would you like to see if the app becomes fully-developed?

1. _____
2. _____
3. _____
4. _____
5. _____

Thank you very much for your feedback,

Jabel Erica Odiamar-Bercasio

MsC Instructional Design and Technology

University of the West Indies – Open Campus

Appendix E – Survey Results

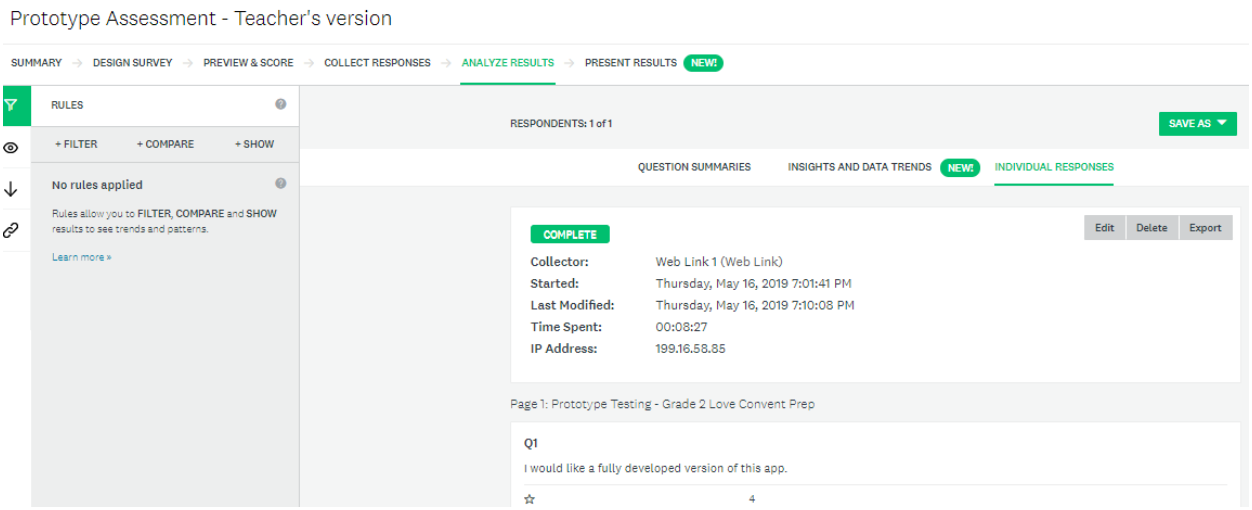
Overall Survey Results (20 Respondents)

Likert Scale: 1 – Strongly Disagree, 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree

Question	5	4	3	2	1
I would like a fully developed version of this app.	13	5	2	0	0
It promotes parent and child collaboration.	8	8	4	0	0
Users will be able to learn to use it very quickly.	15	5	0	0	0
The theme was consistent all throughout.	14	5	1	0	0
It is free of errors.	20	0	0	0	0
It is a helpful reading support app. (opinion)	2	10	3	3	2
The quizzes were reasonable for their levels.	3	10	5	2	0
The lessons increased in difficulty from level to level.	7	8	3	2	0

The progression makes sense.	16	4	0	0	0
I can comfortably play it on my device.	2	6	4	5	3

Teacher Survey Result



Q2

It can promote parent and child collaboration.

☆ 4

Q3

Users will be able to learn to use it very quickly.

☆ 4

Q4

The objectives to each lesson are clear.

☆ 5

Q5

It is clear what concepts are being highlighted by the level.

☆ 5

Q6

It is a helpful reading support app.

☆ 5

Q7

The quizzes were reasonable for their levels.

☆ 4

Q8

The lessons increased in difficulty from level to level.

☆ 4

Q9

The progression makes sense.

☆ 5

Q10

I can comfortably play it on my device.

☆ 4

Q11

Commendations/Positive Remarks

I fully enjoy the letter recognition skills to paint by letters.As well as the alphabet sounds.

Q12

Recommendations/Criticisms

The read with me lesson I had a bit of trouble using and I would have loved to try it.

Q13

The online links are not original. What type of content would you like to see if the app becomes fully-developed?

Not a direct link to Youtube.com as then then my not come back to your site.

Appendix F – Bloomz Correspondences/Announcements

Announcement 1

Jabel Erica Odiamar-Bercasio
Teacher of Grade 2 Love 2018-19
Apr 2 - shared with Grade 2 Love 2018-19

Testing the Prototype
Parents,

I need to ask a favour. For the next two weeks (from today, 2nd April to 16th April), I will be testing the effectivity of a prototype app I designed.

I have a few disclaimers and info:

- The links are not original. This is a prototype, so I will not have time to fully develop the full app. There are links to YouTube and Educational sites that some of you may be familiar with. I did handpick the lessons according to the levels:
1 - Sounding Out Letters
2 - Matching Pictures to Words
3 - Sight Words
4 - Simple Stories/Sentences
5 - Reading Comprehension

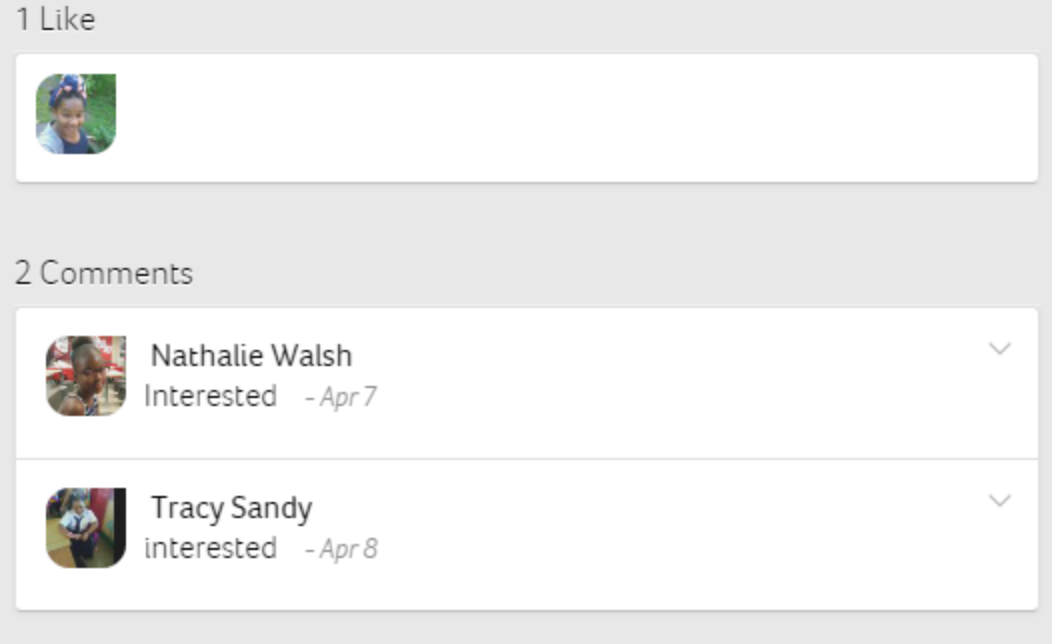
- The quizzes are original. You will be provided with a quiz to end each level. A child cannot move on to the next level if he or she cannot pass the quiz in the current level.
- It is a prototype so it does not have the sophistication of existing apps, but I am hoping that I can develop it into something like that. I need your help and feedback.
- At the end of this week or beginning of next week, I will provide you with a printed survey that you have to answer. It will ask you about your experience and what your recommendations will be to improve the prototype.
-Mrs. Lawrence was the first to test it.
- You can use your phone or your computer to view the games/tests/videos and quizzes. You will need a computer if you want to download some of the downloadable .pdfs if there are in your current level.

If you are interested, please send me a message. I will provide you with the username and password. I will give you a username based on your child's current level. For example, if your child is an advanced reader, he or she can access all five levels. If your child is on Level 1, however, he can only view Level 1. If your child is on Level 2, he can view Levels 1 and 2.

Thank you and God bless.

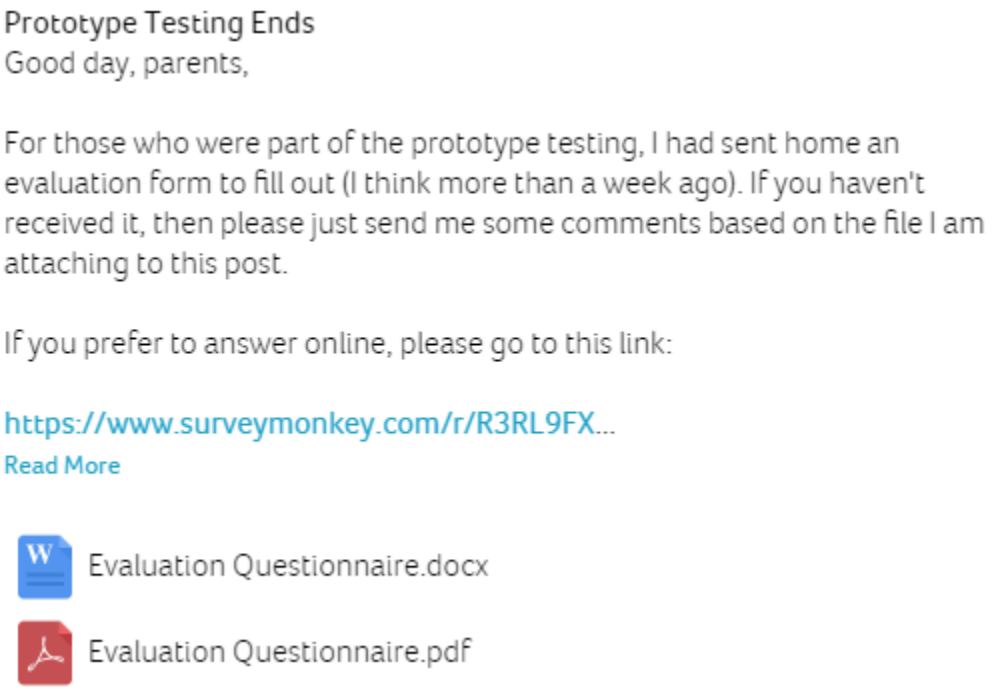
https://q8bwk3.axshare.com/#c=2

Untitled Document
q8bwk3.axshare.com



*Some responded through individual private messages.

Prototype Testing Ends



Final Appeal

Final Appeal Re: Prototype
Happy Easter, parents!

I am sending out a final appeal regarding the prototype I was working on.

The link to the prototype is (in case you can no longer find it):

https://q8bwk3.axshare.com/#c=2

There is a short 3 minute survey that follows. I will be submitting my draft to my adviser this Thursday. For those who have already used the prototype, simply go straight to the link of the survey:

https://www.surveymonkey.com/r/R3RL9FX

Prototype Testing/Interviews Announcement

Prototype Testing Interviews
Parents,

I am seeking your permission in randomly selecting some of the children to be interviewed regarding the prototype. I will:

- ask them to perform some tasks on the prototype using my mobile phone
- take photos and videos of them
- ask questions about their experiences

If you are not happy about the photos and videos, I will not publish them on my website/e-portfolio. There is a YouTube setting that prevents the videos from displaying among the search results.

If you are okay with it, rest assured that it will only be displayed on my e-portfolio. Only professors and graduate students will be able to access and play the videos. The interviews themselves will not include their names. The videos may be taken for just in case my professor seeks evidence of the interviews having taken place. I will also take photos of their hands holding the mobile phone if I do not receive any permission to reveal the child's face.

Just respond to this message with "Yes" or "No" or you can send me a private message.

My final deadline is May 17th. Draft #2 is due anytime. I have one more summer subject to go. *crossedfingers*

Thanks for your continuous support.

Disclaimer/Letter of Consent

Prototype Testing

Prototype Testing - Grade 2 Love Convent Prep EDIT

The link to the prototype is, again: https://q8bwk3.axshare.com/#c=2

Parents, thanks for offering to help. Remember: participating will in no way affect your children's marks. You do not have to leave your name, either. After trying out the prototype, please leave your feedback by answering the following questions. 5 stars means you strongly agree and 1 star means you strongly disagree.

Appendix G – Interviews

I - Testing and Interview of Individual Children

Child #1

Level: 5

1. Do you like the app?	Yes
2. What do you like best about it?	I like the quiz the best.
3. Did you learn anything?	Yes
4. Do you think it can help you read?	Yes, because it has videos
5. Will it make you study? Why/Why not?	Yes, because it is interesting.
6. Would you like more texts?	Yes
7. More games?	Yes
8. More videos?	Yes

Child #2

Level: 2

1. Do you like the app?	Yes
2. What do you like best about it?	Games
3. Did you learn anything?	Yes
4. Do you think it can help you read?	I think so (said No, then Yes)

5. Will it make you study? Why/Why not?	Yes
6. Would you like more texts?	Yes
7. More games?	Yes
8. More videos?	Yes

Child #3

Level: 1

1. Do you like the app?	Yes
2. What do you like best about it?	Games
3. Did you learn anything?	<no response>
4. Do you think it can help you read?	Yes
5. Will it make you study? Why/Why not?	Yes. I like games.
6. Would you like more texts?	No
7. More games?	Yes
8. More videos?	Yes

Testing Observation and Interview Results with Remedial Teacher

1. Level 5 M. S. (the child's initials)

The first child started on Level 5. She was given instructions to click buttons that she felt comfortable with. She was told that she could choose any level. She chose to go straight to Level

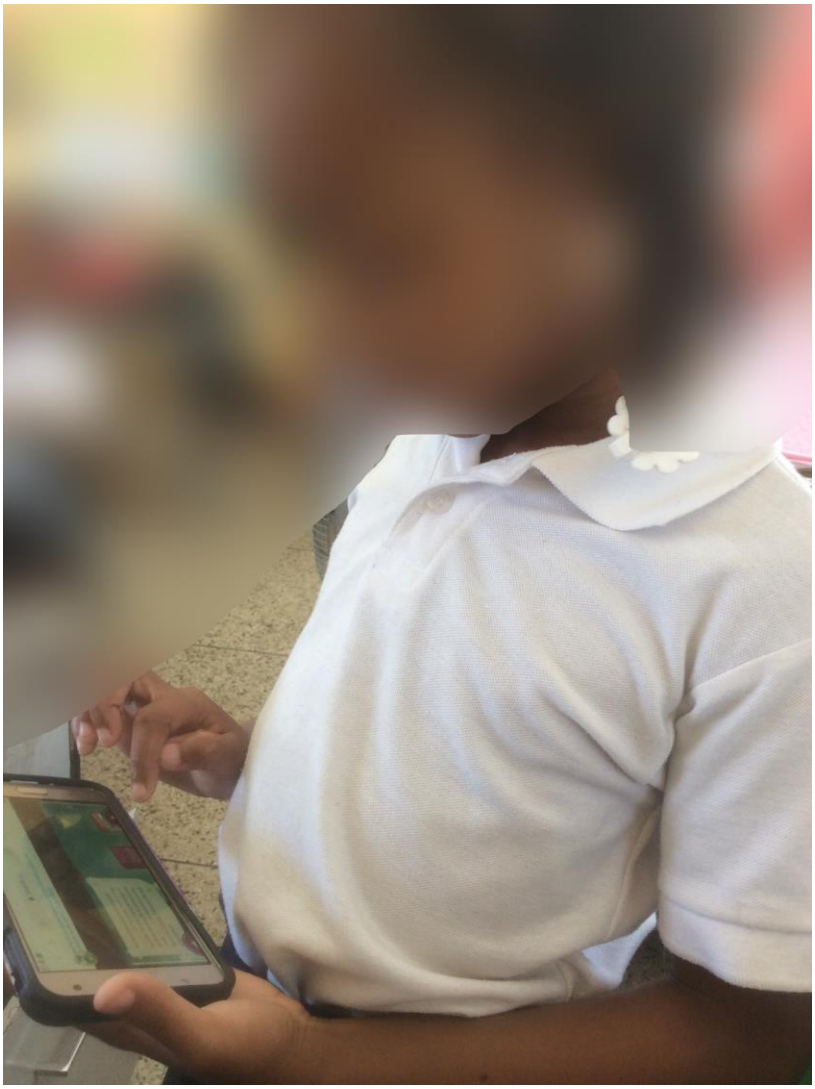
5. She played one of the games. The remedial teacher observed that she was getting agitated because the third party game was too long. Student M.S. answered 20 questions and was still going. She was able to answer most of the questions on her own but had to ask the remedial teacher what a duck's "bill" was. According to her, she learned some concepts through the game. After about 20 questions, she was asked to move on to the quiz. She was more comfortable answering the questions in the quiz. It was a mere 10 point quiz. She received a 6/10 or 60%. The passing rate is 70%. Therefore, she needs to go through more sessions, perhaps by trying the other games and watching the videos. Student M.S., according to the Remedial teacher, understands the concepts but may need some help with some of the vocabulary words to fully understand a couple of questions. The Remedial teacher concludes that the student is in the correct level and is learning some concepts but may initially need some support in getting around the app. She also says that the app can be more comfortably used within tablets, compared to smaller phones.

2. Level 1 K. H.

The second child started on Level 1. Unlike the first student, he was pressing on several buttons all at once to see what will happen when he does that. He depended more on "trial and error" compared to Student M.S. Student K.H. was more dependent on colors and sounds. However, this previously unengaged boy has shown interest in continuing the Level 1 games, even after the bell has rung for break. He still struggles through the app because of his poor reading skills. He needs assistance, according to the Remedial teacher, but he is interested in using the app and believes that he can learn better through it. The student needs the support of a louder volume for the oral instructions. He will be able to benefit from that if

he were in the confines of his own house and not in a classroom setting, with 27 other children in proximity.

Appendix H– Photo Documentation (Live Testing)



Section I - Timeline Final Design Project Activities

Deadline: May 17, 2019

Task	Details	Estimated Deadline	Actual Finishing Date
E-Portfolio	Add reflections	Present up to next weekend, 17th February	May 12th 2019
Design Project Paper, First Draft	Outline, literature , design of proposed app	Present up to end of month	April 25th 2019
Development of Proposed App	Adobe Photoshop graphics, Adobe XD prototype	Present to mid-March (up to third week at the latest)	April 2nd 2019
First Testing of the App	Surveys sent out to parents	Mid-March to Mid-April (right before the Easter break)	April 2nd to 16th 2019
First Design Project Paper Feedback	Comments on clarity, purpose of surveys, appropriateness of questions		May 1st 2019
First Revision/Writing Draft 2	Getting help of first and second readers, revisions, editing, adding of results	The weeks leading to the final submission	May 11th 2019
Submission of Final Project Design			May 17th 2019