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**Background**

The business industry we have decided to dabble in is education for children who are aged seven to ten years old. In the world of education, several factors have contributed to its development, such as the behaviour of students influenced by parenting skills, how teachers teach their lessons, and student’s ability to use technology and media. However, one thing that has remained the same is how students struggle to stay engaged or focused while dealing with [challenging](https://studyfinds.org/math-homework-harder-for-parents/) subjects like mathematics. Furthermore, we chose to dive into the education industry because statistics have shown that children aged seven to ten get frustrated when working on challenging mathematics questions, while others are unable to comprehend the topic, leading them to daydream in class or become frustrated, both of which are detrimental to their mental health.

**Problems Children faced**

The problem faced by students aged 7 to 10 is that they are lethargic and disengaged during lessons. The reason is that they could either be falling behind in class, are not sufficiently challenged, do not know or like to learn and memorise the material to do well in exams, and the learning material itself is not appealing for them to learn. Research has shown that students who are bored perform poorly in school, are at risk for superficial information processing, i.e., can only remember things for short periods, have low attention spans, skip assignments and homework, and are less likely to put forth effort in school. This causes them to be unable to progress well in their education journey. Having the occasional occurrence of being bored may cause them to feel distressed, apathetic, or even frustrated when they realise that they can’t do well in school. It is even suggested that this would increase the likelihood of young children dropping out of school altogether in later years.

**1) Falling behind in class**

The reason is that young children have a short attention span when doing tasks that do not match their abilities and interests. So, once they conclude that what the teacher is teaching is boring, they will most likely stop paying attention to that lesson, causing them to have a stigma in their mind, "This lesson is boring, I do not want to listen." Thus, causing them to fall behind in class

**2) They are not sufficiently challenged**

Sometimes, gifted students get bored in school when the material does not keep up with their interests and abilities. Doctors like Dr Gwyn explain that students who do not need much instruction to master a skill or stay ahead of the class often complain of boredom. So when the material given is too easy for them, they can become bored in class and seem unmotivated.

**3) Do not know or like to learn and memorise the material**

It is common for students who don't know or don't like to learn and memorise materials to be lax in their work and not study much at all. Thus, they tend to rush through their work without editing or rechecking, leading to their work being sloppy. As a result, they need motivation and interest in their learning in order to succeed in their education.

**4) Learning material itself is not appealing for them to know**

For example, textbooks are difficult for young students to read because a textbook is overloaded with information such as names, equations, numbers, charts, tables, old concepts, new concepts, and familiar and unfamiliar vocabulary. Without teaching them how to properly manage the information given to them, many students lose their way through the text and also lose motivation to move forward. As a result, they would become bored with studying and learning.

**Business Needs**

**1) An easier way for them to learn/revise**

Students, especially those as young as 7, do not like the traditional way of studying and reviewing, sitting down to do maths homework or staring at a piece of paper for hours to memorise information for an exam or test. So playing games can help them have fun and enjoy learning and studying. It also helps them activate their effective information processing and long-term memory, and the information they learn while playing games can be easily retained. This can be a source of interest for them to learn or practise.

**2) Improve memory retention and mental development**

According to a recent study exploring the link between games and working memory, playing educational games as a child can improve a person's working memory years later. Researchers have also done an experiment on assessing the cognitive function of participants such as their reaction time, working memory, attention span, and problem-solving. Researchers found that participants with early experience with games had improved their working memory. So having games for students can help them develop mentally and can also be useful for children with short attention spans. In addition, games are usually about exercising memory and solving trivia questions. This helps students memorise the concepts of the game and also improves their general knowledge and academic skills.

**3) Engagement**

The 3rd industry’s need is the ability to keep the students engaged in the course of their education. Engagement improves students’ learning because when they are engaged, they will be more focused on their work. This means that they are more likely to learn and not forget what they have learnt which helps them to grow. Research has shown that engaging students in their education increases a student’s attention and motivates them in undertaking higher-level critical thinking. Engagement provides more opportunities to deepen their learning and helps in developing stronger self-regulation so they are less likely to engage in off-task or disruptive behaviour.

**4) Developing critical thinking**

Critical thinking is at the forefront of learning, one of the most crucial skills to have as both an individual and a society. It is crucial for success in school, career and daily life, an invaluable skill in many workplace scenarios. Students can improve their academic performance with critical thinking. Teaching students to reflect on their own knowledge and information presented to them. It plays a vital role in effectively improving a student’s decision-making, problem-solving and research skills. Hence, helping students to solve problems and make decisions. With critical thinking, students will be able to think independently, clearly and rationally when a situation demands it. Students are now faced with a world of information, therefore, critical thinking helps them in processing information critically and logically.

**1) Mathematics Game (The Arithmetic)**

How does it work?

1. Players will have the option to select addition, subtraction, multiplication, and division
2. There will also be a randomised mode which will generate questions of the 4 types randomly
3. After deciding which game mode they want, questions will appear for the player to answer
4. The player will have 3 lives, answering a question wrongly will deduct 1 life while answering a question correctly will earn them a score of 1
5. There is no time limit to this game, the objective of this game is to earn as many scores as they can with 3 lives

**2) Memory Game (Flip Flop)**

How does it work?

1. Players choose two cards at a time and try to find two cards that are exactly the same.
2. If the player managed to find two of the same card, the cards will be removed
3. Else, 1 life will be deducted
4. The game will continue until all cards have been cleared or there are no more lives left
5. There will be three levels, easy, medium, and difficult
6. As the level of difficulties increases, the number of lives will decrease

**Scratch File**

**Arithmetic Game**

<https://scratch.mit.edu/projects/787145579/>

**Flip-Flop Game**

<https://scratch.mit.edu/projects/787048051/>

**Discussion** (How our game meet the business needs)

| **Arithmetic Game** | **Improves memory retention and mental development** | **Easier method for children to learn and revise** | **Engagement** | **Developing critical thinking** |
| --- | --- | --- | --- | --- |
| **How it links to each business needs** | Encourage children to recap what they learned in school which develops their muscle memory for retaining information. | Alternative method to learn or revise instead of reading and doing it in a textbook or workbook. | With the Arithmetic game, kids can enhance their attention span and learning process as they practise maths concepts through exciting visualisations of the sprite and background, as well as audio feedback when they get a question right or wrong. | Throughout the game, kids acquire transferable skills such as the ability to think logically and critically that can be applied in their everyday lives. For example, they are able to manage their money (addition and subtraction), share items between siblings and friends (division) and multiply items in bulk (multiplication). |
| **Flip-Flop Game** | **Improves memory retention and mental development** | **Easier method for children to learn/revise** | **Engagement** |  |
| **How it links to each business needs** | Memory game allows children to improve their attention span and short-term memory as they need to be focus in order to remember the placement of the cards | As the memory game enhances children’s short-term memory and concentration. It aids them in learning as they will not getting distracted easily now and can retain more information | Memory card games combined with the different sprites and stunning moving visuals are much more engaging as it increases the childrens’ focus and concentration since children are naturally attracted to colourful visuals.  Naturally, when playing games, children will aim to win, this captures their attention and participation. Therefore, they will be more actively involved and invested in the game. This in turn, will make children more focused and motivated in their education. |  |