Engaging Science Education for Teens

> Project Idea by Wandile Ndaba (1 Mar 21)

1. Introduction

1.1. Introduction of project goals

- The goal of my project is to create a website that teaches STEM (Science, Technology, Engineering, Mathematics) material to teenage students. I aim for it to be preferably story-based, highly visual and applying best practices and teaching strategies informed by the latest learning science. It will implement an audio voice-over that students can activate whenever they get stuck on a topic.

1.2. Benefits to end-user

- The challenging nature of the material will ensure that, once it's mastered, the student will feel a great sense of achievement. This will have a positive impact on their esteem and self-image.
- The ultimate result will be the enrichment of the student's learning, a result that will get them onto the path to acquiring in-demand skills, and preparing them well for the jobs of the future.

2. Expected List of Features

2.1. Features list

The facilitate the student's learning journey, many features will be utilized:

1. An **audio player** somewhere on the page.
2. A **progress bar** visible at all times.
3. An intuitive and accessible **navigation system**, incl. breadcrumbs.
4. A mobile-first, **responsive design**.

5. Implementation of various **learning strategies**, e.g. SEE-I learning framework.
6. A **flashcard app** using spaced learning

2.2. Justifications

1. The audio player will be used for the guided tour voice-over that will be on all course material.
2. The progress bar is to visually show the student's progress through the lesson. It will be visible at all times.
3. The breadcrumbs navigation will show student's where they are currently on the webpage.
4. A mobile-first, responsive design is necessary as most online traffic today is mobile, especially amongst my target market.
5. The implemented learning strategies will improve student comprehension and give them a deeper understanding of the content.
6. The flashcards will serve as a post-test to help check student's comprehension of the material.

3. Market Survey

3.1. Survey

1. Brilliant
2. Khan Academy
3. Breadcrumb app
4. Art of Problem solving
5. Coursera

3.1. Feature Comparison w/ Survey

1. **Brilliant** has a fantastic visual based learning environment.
   This will be my aspiration for my website. I'll implement a similar visual style,

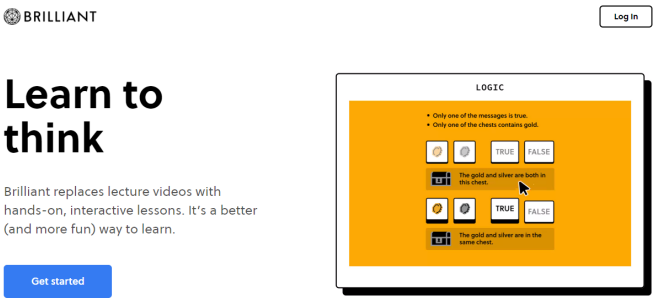
Brilliant uses interactive games well. Unfortunately, this feature will be beyond what I can deploy onto my website with my current skill level.

2. **Khan Academy** uses well implemented, self-guided interactive learning.
   My website is not meant to feel like an online classroom, more like a series of in-depth articles on complex ideas, tackled with the help of an expert guide always nearby (through the voice-over).
3. **Breadcrumb app** focuses on personalized lesson plans that student's work through at their own pace.
   I love this feature and my aim is to implement something similar into my website.
   - The visual branding of this website/app is also note-worthy. The colourful, fun but not childish aesthetic is highly effective. This is similar to what I envision for my website.
4. **Art of Problem Solving** offers the most complex topics as learning material of any other application in my survey.
   This is a similar level of difficulty that I aim for the material on my website.
5. **Coursera** functions more like a marketplace, allowing course designers from colleges and universities around the world to offer their courses online to a larger market.
   This feature is my ultimate future goal for this project. It will help my website grow much larger and reach more students if others can contribute the course material.

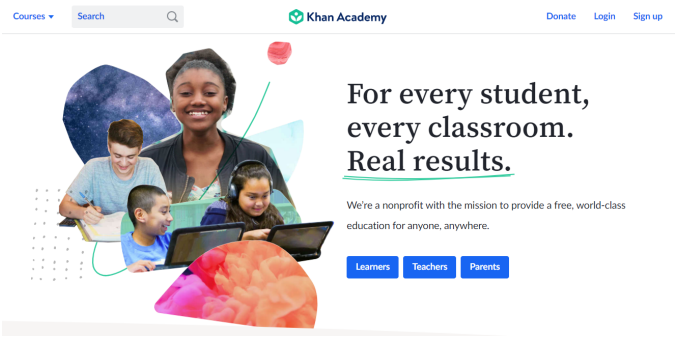
4. References

4.1. & 4.2. Reference Material & Relevant Links

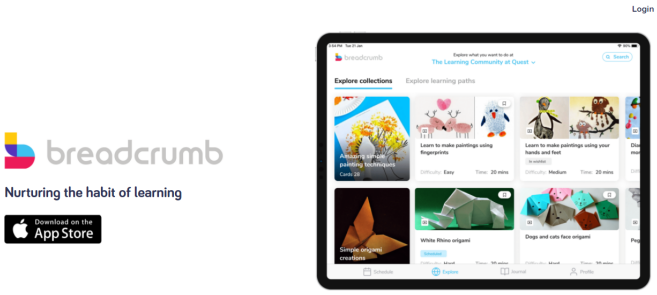
1. https://brilliant.org/

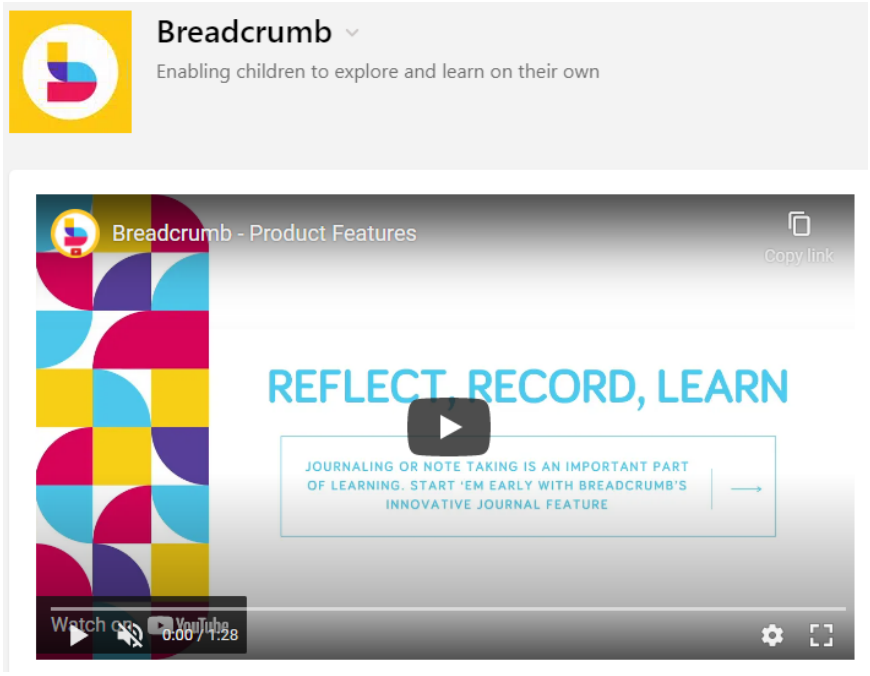


2. https://www.khanacademy.org

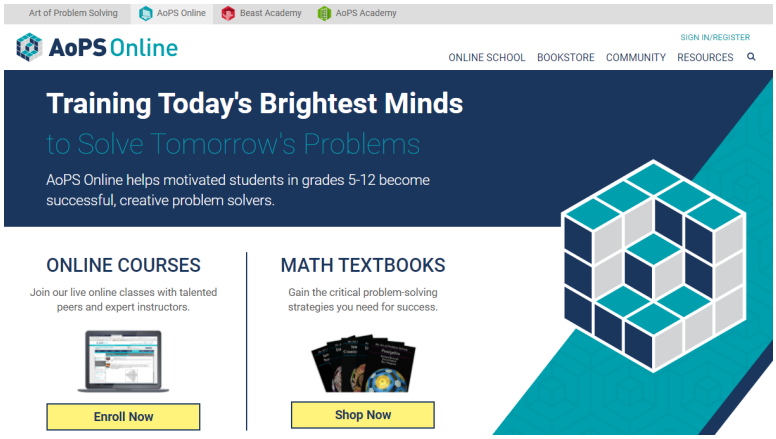


3. https://learnwithbreadcrumb.com/

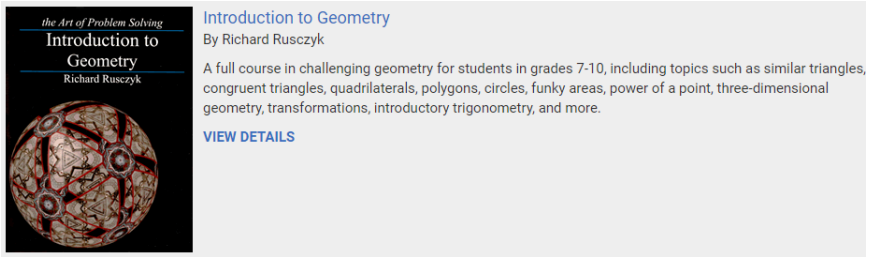




4. https://artofproblemsolving.com/online



▼ https://artofproblemsolving.com/school/course/intro-geometry?gtmlist=Schedule_Sid



5. https://www.coursera.org/