

# reVu

A MORE EFFECTIVE STUDY SOLUTION

*by Katelyn Earl*

To view accompanying prototype, visit [www.katelynearl.com/revu/preview.html](http://www.katelynearl.com/revu/preview.html)

# TABLE OF CONTENTS

## 1.0 INTRODUCTION

1.1 Experiment Overview	4
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## 2.0 PLANNING

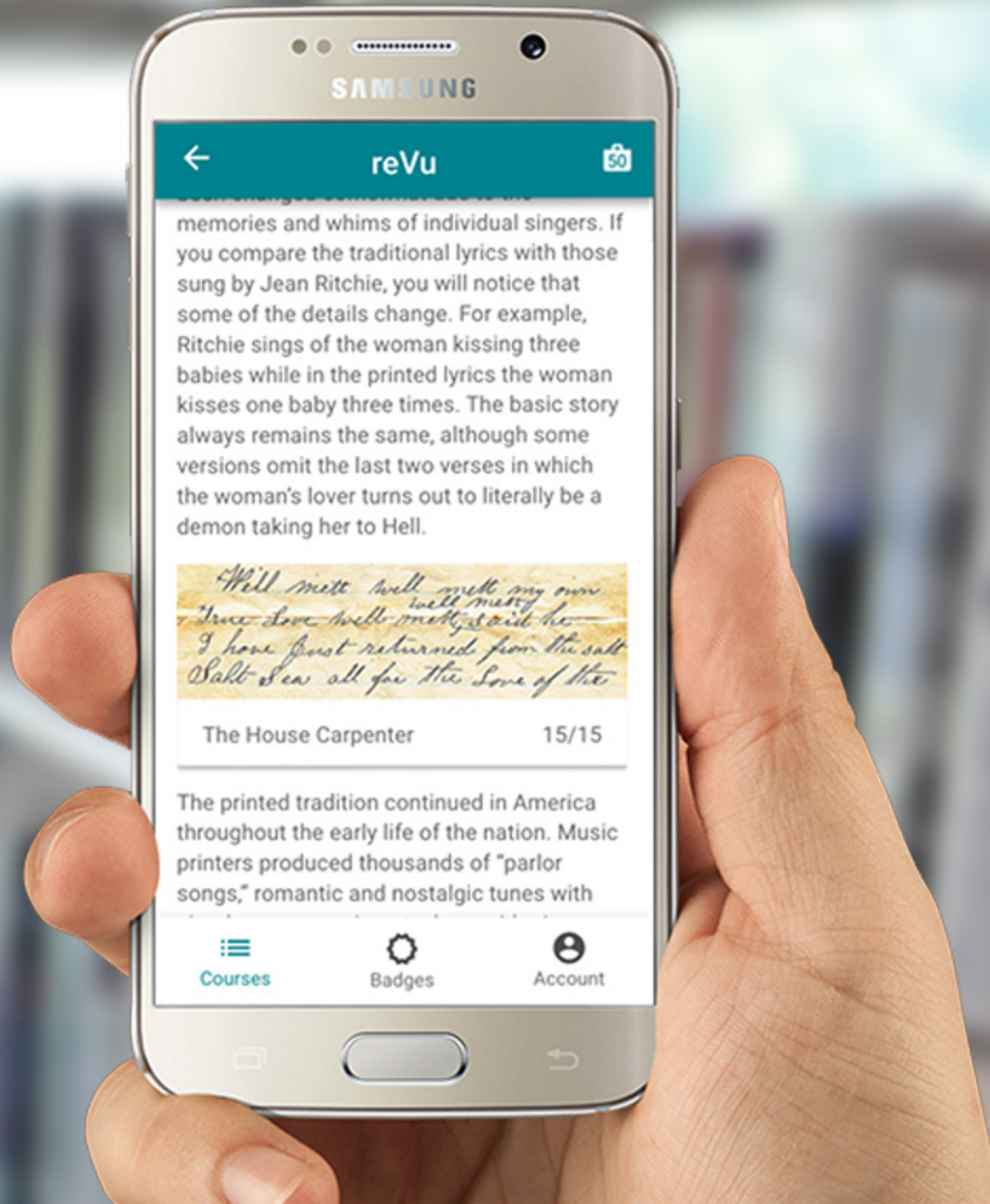
2.1 Defining the Problem	6
2.2 Mapping the Experience	7
2.3 Finding the Audience	8
2.4 Building the Structure	10

## 3.0 SURFACE & PROTOTYPE

3.1 Home Screen	12
3.2 Module List	13
3.3 Individual Modules	14
3.4 Activity Cards	15

## 5.0 Appendix

5.1 Project Brainstorm	17
5.2 Concept Map	18
5.3 User Experience Map	19
5.4 App Structure	20
5.5 Sketches	22



## 1.0 Introduction

# 1.1 EXPERIMENT OVERVIEW



## PROBLEM & OBJECTIVE

There are many different e-learning resources for students and professors but each tool focuses on different styles or methods of teaching. While these methods have their benefits, a hybrid environment would have a more positive experience on a student's studying experience. Once created, this hybrid can and should be used to optimize student understanding in and out of the classroom. This project will be used to experiment how basic design principles can not only enhance educational resources, but create the hybrid environment by combining teaching methods in an attempt to increase the overall depth of processing and long-term memory by college-aged students.



## HYPOTHESIS & PRINCIPLES

By enhancing traditional teaching and studying styles with the principles below, I believe that the app I am designing will create an environment where students are more motivated to study, which will result in better understanding of concepts and the long-term memory of that information.

**Chunking:** The concept of chunking information into 3-6 modules has been proven to accomplish my objectives. For this reason, the app will be structured as such. It will also create consistency with current e-learning environments, such as Canvas.

**Gamification:** The implementation of games, flashcards, tests, and badges will increase student engagement in the studying experience by providing an interactive way to learn or study the content that accompanies the game elements.

**Visual Weight:** Visual weight will be used to "exert force" and draw attention to the most important information within the modules. This content will typically be related to specific objectives and/or test questions.



## FINDINGS & FEEDBACK

After designing and prototyping an app that reflected the "best practices" for the principles I had chosen and researched, I was able to do a basic demonstration and explanation of the app to my target audience. I found that they really liked the concept of earning coins to purchase materials, and that they would use the app to study. However, a survey I conducted at the end of my experiment provided different results than I had hoped to accomplish.

Through my survey, I found that similar to my app design, people find videos and text as the most valuable studying resources. However, I had also placed a lot of emphasis on practice tests, but learned that students care more about the flashcards than a test. The survey also proved that while I had hoped and researched how visual weight would draw attention to specific pieces of information, the way it was designed in the app didn't make a difference in whether they understood the information.



## 2.0 Strategy

# 2.1 DEFINING THE PROBLEM

## PROBLEM

There are a variety of e-learning tools for students and professors to teach and study curriculum. Each of these tools have their positive and negative aspects, but there is no app that incorporates all of the positive qualities to provide an optimal learning experience and increase Depth of Processing for students.

For example, Canvas has the capability for professors to structure their curriculum for students to study in the form of modules, but beyond traditional information design and testing, the software provides little interaction and is somewhat "static" to students trying to study.

On the other hand, Quizlet provides an interactive environment for students, by using study methods such as flashcards

and games, but teachers have no control as to what curriculum included, or if the information their students have input to study is correct. While the games and study methods could be effective, and are quite enjoyable, many of those games or study tools are not built for a typical definition-term structure or entirely flexible questions, such as the test generation.

## SOLUTION

The app reVu will bridge the gap between professor controlled curriculum and interactive learning that we discussed between

softwares such as Canvas and Quizlet. By providing a way for teachers to add relevant and accurate content, as modules in an app, then turn that content into different types of quizzes and games, students will finally be provided with an fun and interactive way to study for classes and exams and teachers will have control over what their students are learning outside the classroom. Studies have shown that these study methods not only increase Depth of Processing, or long-term information retention, but encourage student participation and motivation. This will in turn improve student grades, which not only play a role in student GPA's and graduation, but are also taken into account when professors and students are being evaluated.



### CANVAS BY INSTRUCTURE

- Positive:
- Teacher controlled
  - Allows modules or units
  - Effective tests and quizzing
  - Course specific

- Negative:
- Little interaction
  - Wifi dependent
  - Traditional teaching

### QUIZLET

- Positive:
- Customizable
  - Built-in study cards
  - App allows access anywhere
  - Study games

- Negative:
- Student controlled
  - More room for error
  - Restrictive term and definition format

### REU

- Proposed app features:
- Flashcards, learning games, and tests
  - Units with varying types of content (videos, pictures, text, etc.)
  - Teacher controlled/relevant content

- Outcomes:
- Concepts retained long-term
  - Better grades for students
  - Students who are motivated to study

## 2.2 MAPPING THE EXPERIENCE

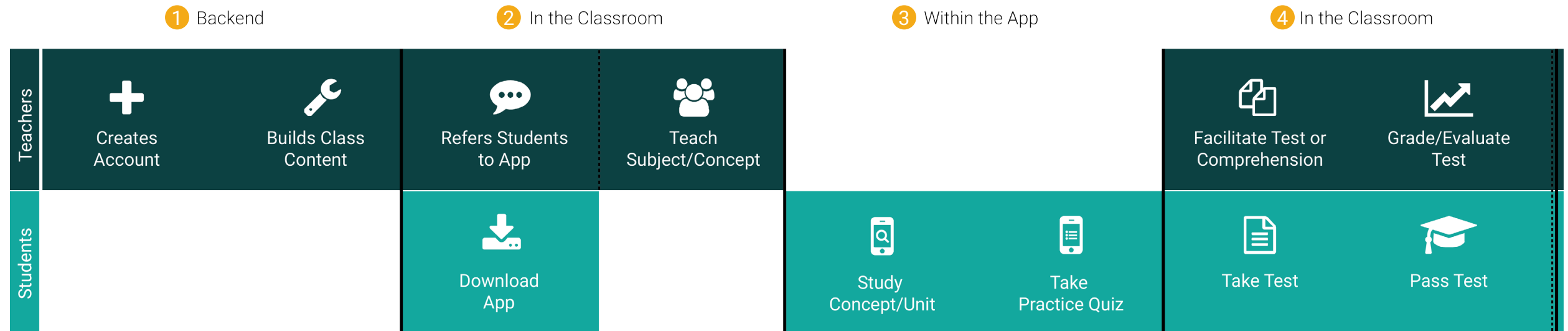
### OVERALL EXPERIENCE

With the initial app idea and users in mind, I began mapping out how the system would work and be used on the audience's end. Through this process, I realized that there were two parts of the system that would need to be designed, and that I would need to figure out how they would integrate and come together in the classroom. In mapping this process out, I was able to separate my two main shareholders, students and teachers, their main goals within the system, and how it will effect the designs of the back-end/database, which will only be used by professors to input and design curriculum, and the front end/app that is mainly going to be viewed and used by students.

### EXPERIMENT FOCUS

Because there are two parts of this project, I decided that for this experiment, I needed to narrow the scope to focus on the second half of user experience. This means that I will be designing the front end of the app, and more specifically the information design of sample curriculum. Then, using the "in-classroom" experience, I will test the effectiveness of the principles I am incorporating. However, it is necessary for the back-end and "in classroom" referrals to the app be included as part of the experience because the front end will need to incorporate a way to add/subscribe to courses that instructors have built.

- 1 Although it will not be focused on during this experience, reVu will require some type of back-end for curriculum and course design.
- 2 The "in classroom" referral process will also not be focused on during this project, but will require some type of course subscription feature within the app.
- 3 The app design, and study material design will be the main focus of the experiment, and will show the results of my research of design principles.
- 4 The "in-classroom" testing experience will model the way I conduct user/principle testing of this experience.



# 2.3 FINDING THE AUDIENCE

## THE STRUGGLING FRESHMAN



*“After working all day, there is no way I want to study. It’s boring.”*

Noah has recently graduated high-school, where he was an average student with decent grades. However, he is struggling to transition from the interactive learning environment of his high school, to the traditional teaching style of the large university. Between school and working strange hours as a tech support specialist, Noah is struggling to keep up with his Biology course, because after working, he has little motivation to study class notes. Although he doesn’t care if he gets the best grades, he knows that he must get a “B-” in order to get into the Environmental Science program. After speaking with his professor about his concerns, his professor suggests downloading and subscribing to his reVu course to not only help him sort through class curriculum, but also use it as a bridge between the more advanced college curriculum and an interactive learning environment.

**Name:** Noah Smith  
**School:** Boise State University  
**Class Standing:** Freshman  
**Major:** Environmental Science  
**GPA:** 3.4  
**Occupation:** Tech Support  
**Hobbies:** Long-boarding, Gaming, Sports  
**Favorite games:** Minecraft, Super Mario  
**Devices:** iPad, Nexus 5, Lenovo Laptop  
**Tech experience:** Pro

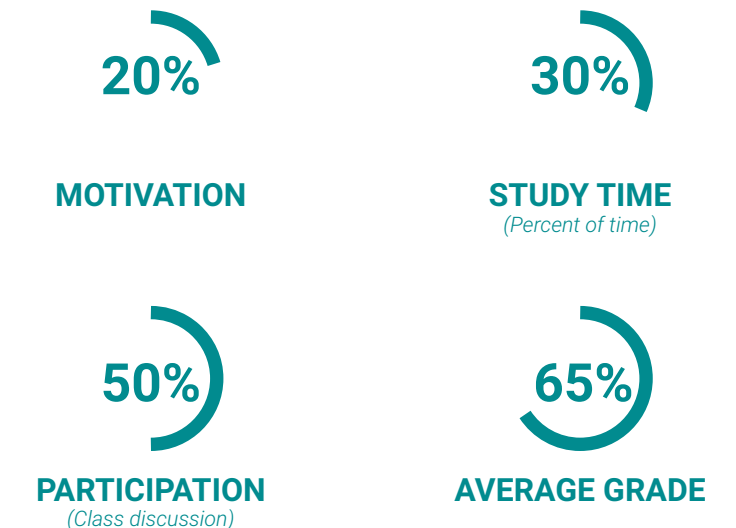
### NEEDS

- “I need to find a studying method that is interactive to motivate me to learn the material.”
- “I need to find a way to help me improve my test scores, so I can get into my program.”
- “I need a study method that I can do during my break.”

### CONCERNS

- “I won’t understand the content that is being covered.”
- “Studying will be boring and it will be more like an online class.”
- “The app won’t motivate or encourage me to study, and I will not get the required grade for my program.”

### CURRENT STUDY HABITS





# 2.3 FINDING THE AUDIENCE *(continued)*

## THE OVERACHEIVING JUNIOR



*“I want to make sure I am prepared for the next test.”*

Samantha has always been a perfectionist when it comes to her school work and she is no different in college. Although school has come easy to her, she is always looking for ways to study so she can further understand concepts, and feel confident when it comes time to take tests. She likes to keep track of her progress, and has used Quizlet.com in the past, but she is frustrated that many of the features, such as the test generation, don't work as well as she'd hoped for some subjects, and that there is no guarantee that the curriculum she is studying is 100% accurate. At the beginning of the semester, her teacher recommended that students take advantage of reVu as a studying tool, because they will be able to study the content that is directly related to the tests they will be taking. Hoping this will be a step up from Quizlet, Samantha downloads the app and is ready to study.

**Name:** Samantha Edwards  
**School:** University of Louisville  
**Class Standing:** Junior  
**Major:** Marketing  
**GPA:** 3.9  
**Occupation:** Campus Ambassador  
**Hobbies:** Reading, dance, music  
**Favorite games:** Super Mario, 2048  
**Devices:** iPhone, MacBook Air  
**Tech experience:** Average

### NEEDS & WANTS

- “I need the app to have content that will help me understand curriculum, rather than memorize it.”
- “I want to be more confident when taking a test
- “I need a new way of studying, that is more accurate and challenging than Quizlet.

### CONCERNS

- “I'm afraid that the curriculum will be like Quizlet, where it isn't monitored or relevant.”
- “I'm afraid I will be wasting my time, spending time on an app that isn't really teaching/helping me.”

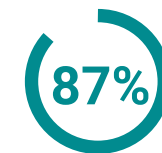
### CURRENT STUDY HABITS



**MOTIVATION**



**STUDY TIME**  
*(Percent of time)*



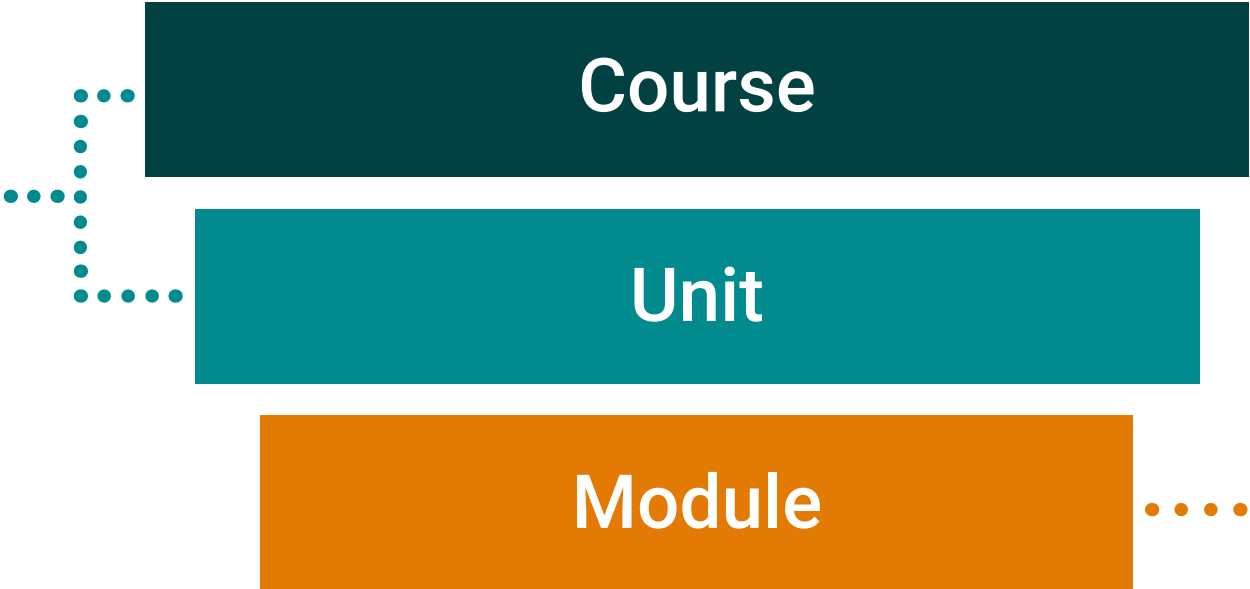
**PARTICIPATION**  
*(Class discussion)*



**AVERAGE GRADE**

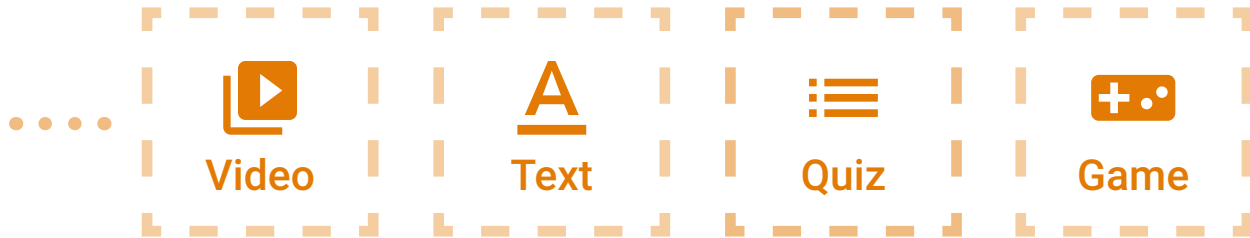
# 2.4 BUILDING THE STRUCTURE

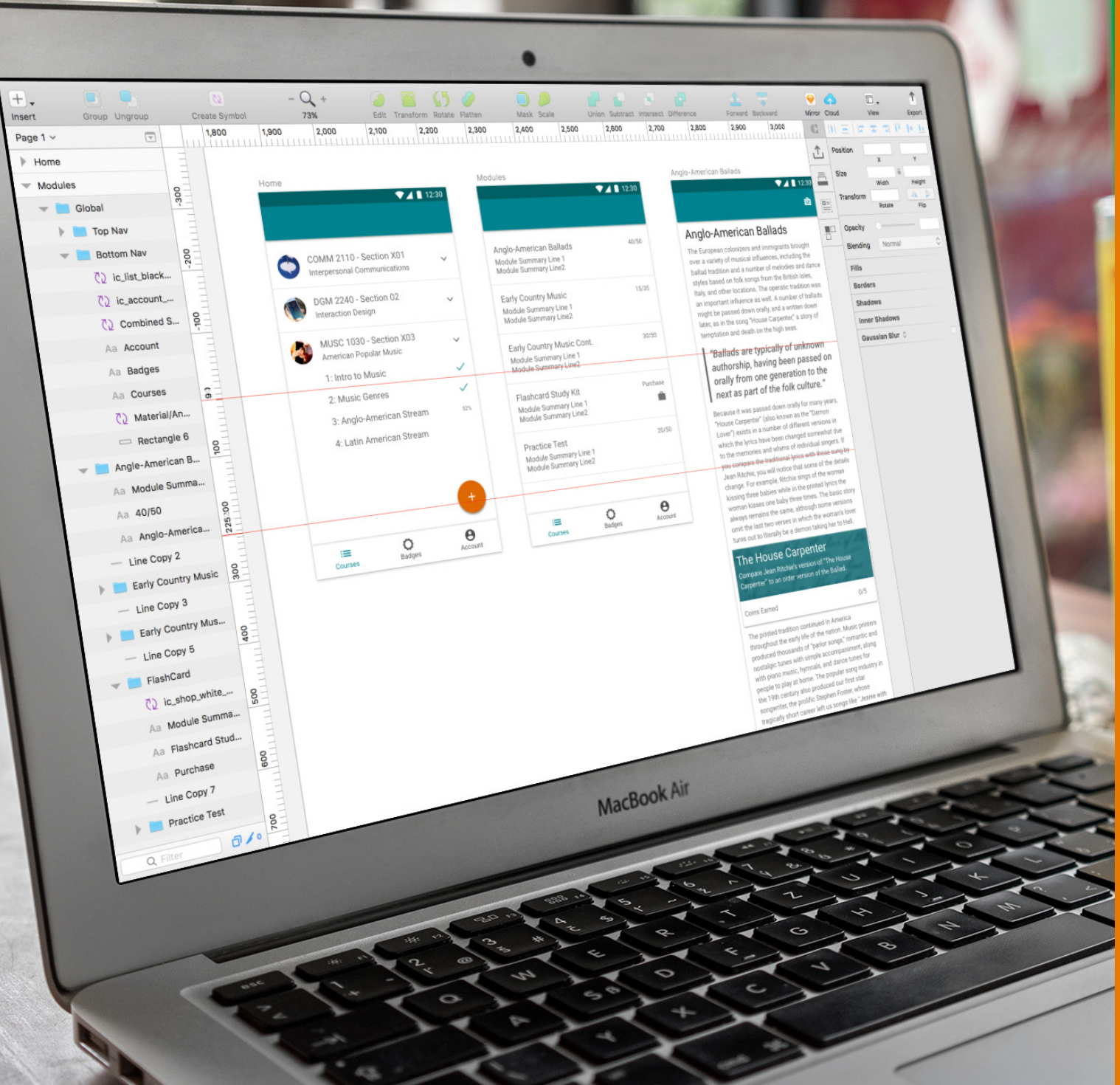
To create consistency between a traditional classroom structure, and the environment reVu will provide, study materials will be structured and navigated using Courses and Units based on the actual class structure.



Excluding tests and flashcards, teachers will be encouraged to organize their content in 3-6 modules. This structure incorporates principle of Chunking which is used specifically when stimulating memory.

The different elements that will be used to create modules is dependent on the course content. Each of these elements are design to incorporate a different level of processing, in addition to the gamification that will make this software unique.



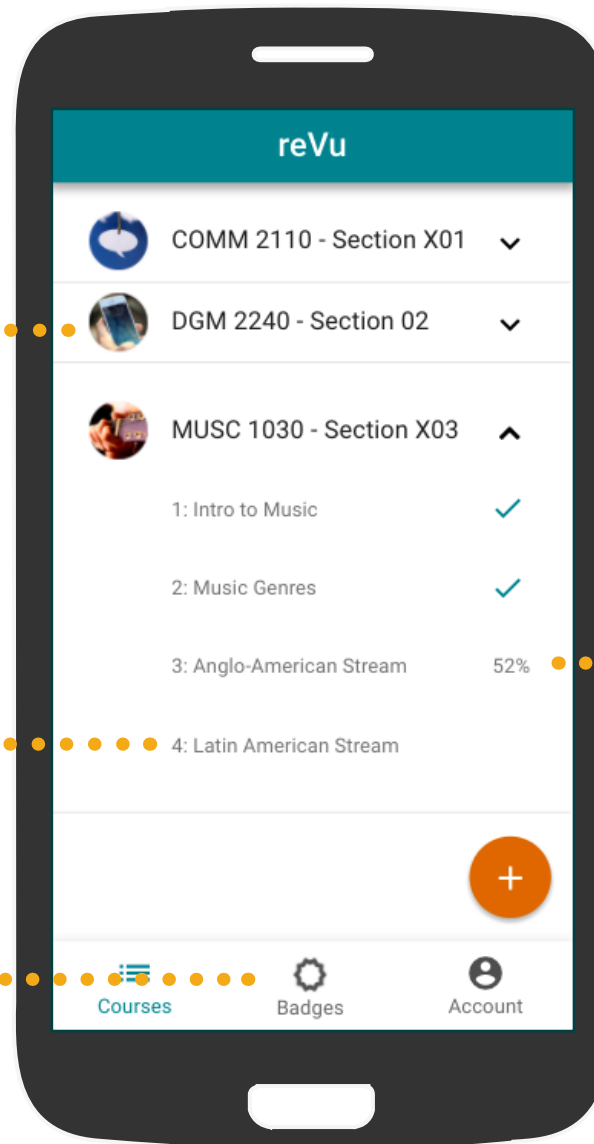


# 3.0 Surface

## 3.1 HOME SCREEN

**Progressive Disclosure:** Using an accordion menu on the home screen reduces the levels of navigation, so students don't get lost within the app. It also keeps everything organized in a way that minimizes content on the screen to units only relevant to the course the user is working on and allows them to focus more on the course materials than navigating it.

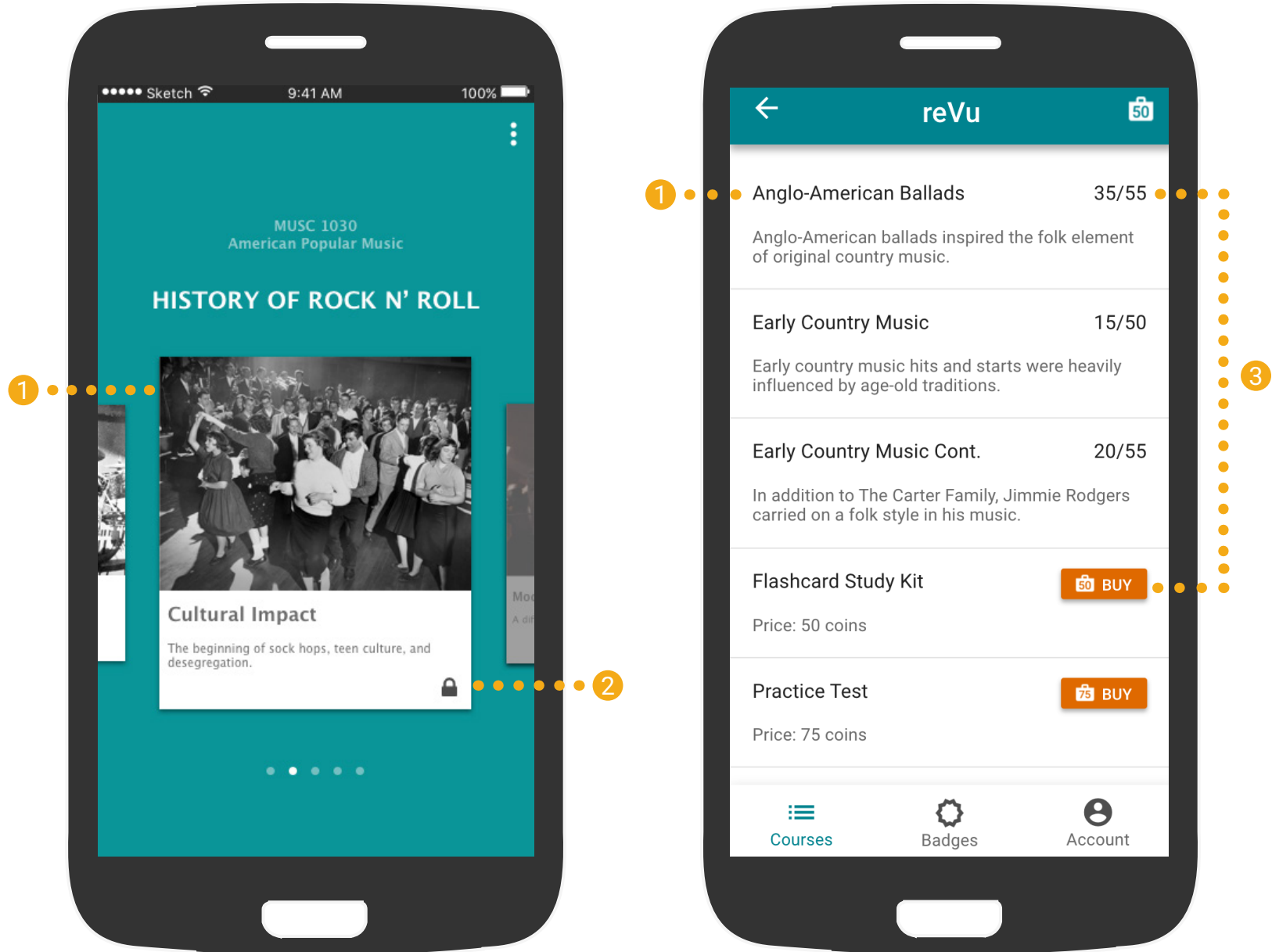
**Gamification:** While this part of the app has not been prototyped because it is not pertinent to the "studying" part of the experience, badges will play a large role in the gamification of this app. After doing research, I learned that badges are an important aspect of gamifying an experience because people feed off of, or are motivated by visual rewards such as badges.



**Visible Goals:** Visible goals is part of the nudge principle that encourages people to perform actions, by measuring their progress against a goal. By displaying the progress of each module and/or unit, this design "nudges" students to work on that course until they have done 100% of the work, or done 100% of the activities and materials so to understand concepts and be prepared for progress to be formally evaluated.

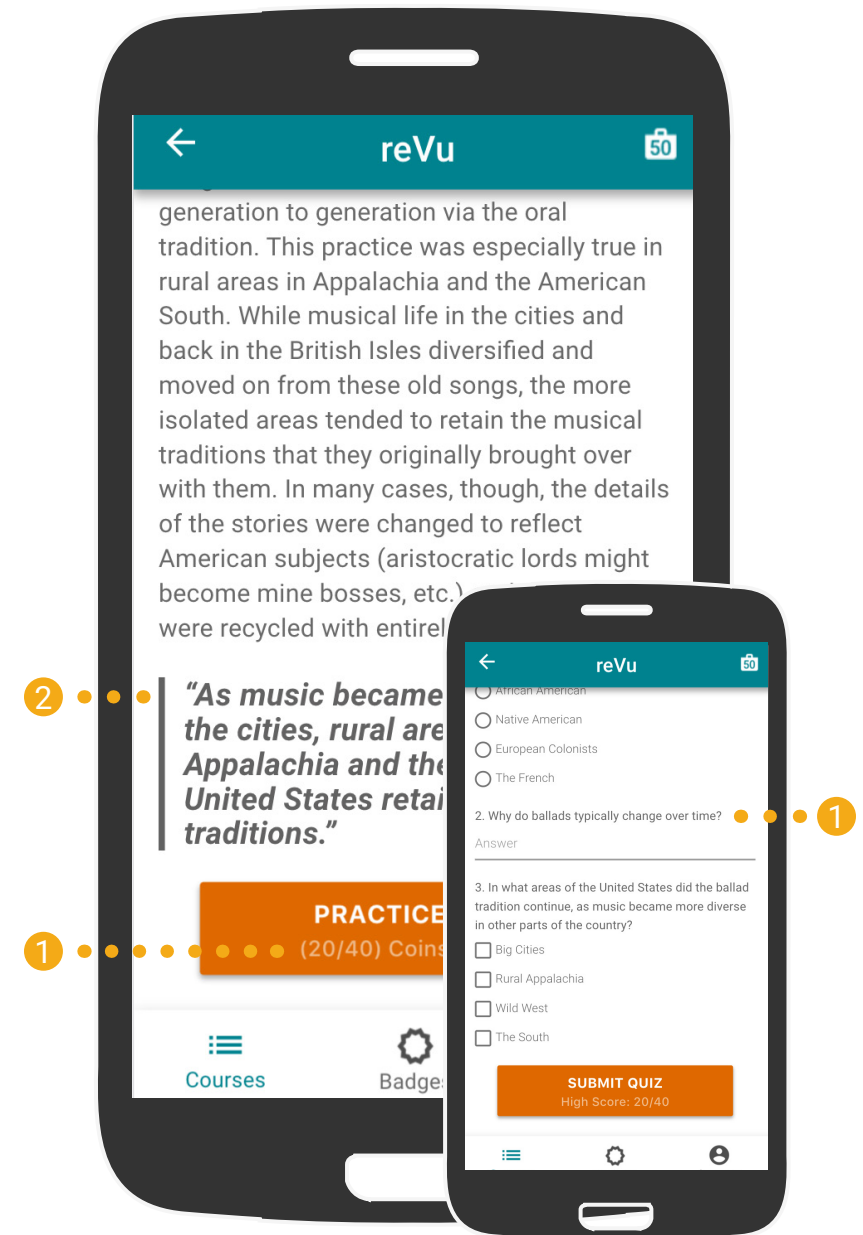
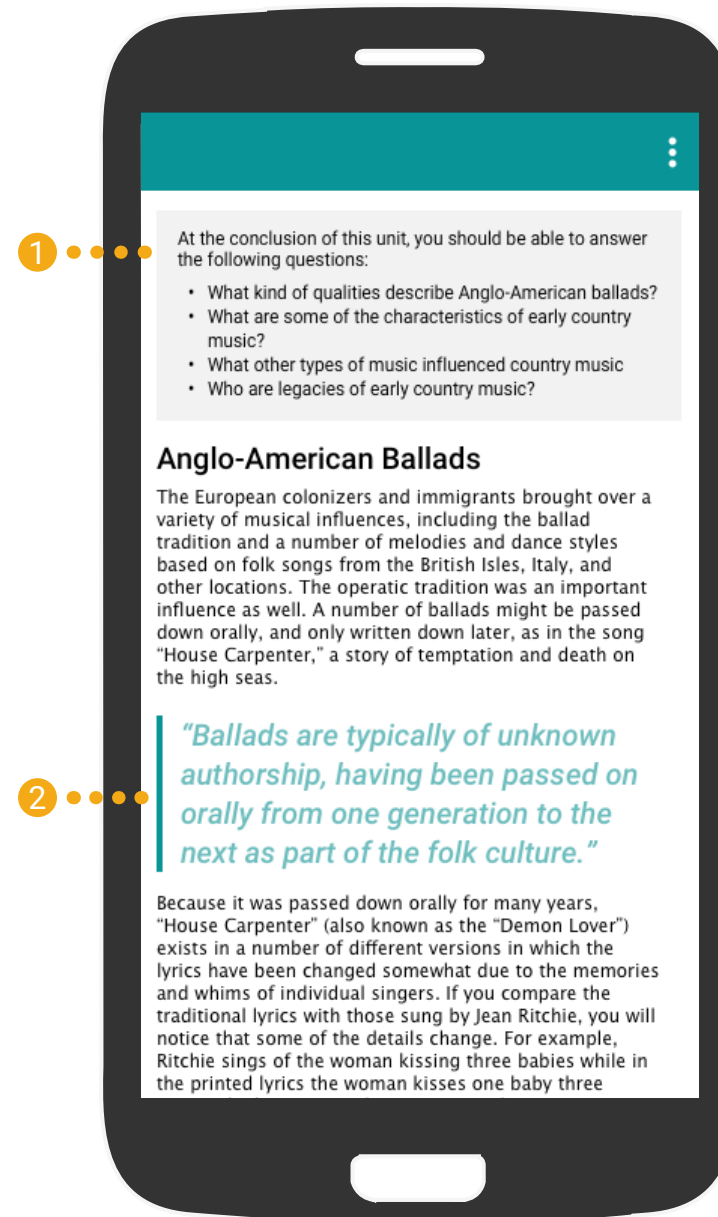
# 3.2 MODULE LIST

- 1 **Chunking:** In my original design, the principle of chunking helped me to create modules that were videos, games, text/images, or quizzes, but I realized that to increase depth-of-processing, it was important to group some of those types of content together, because it would make the levels of processing more clear. The new design incorporates chunking by grouping course material into 3-6 modules, while optimizing the depth of each module by incorporating videos, text, and quizzes in each group.
- 2 **“Stay out of people’s way:”** I first thought that limiting future modules based on ones you had done previously would be a good idea, because I didn’t want people to skip ahead to games and tests. However, after thinking about how the app would be used, I decided that many students may need to study specific objectives more than others, and my design was creating unnecessary obstacles. In the new design, I decided to give people access to modules that were now a combination of videos, text, and practice quizzes, while making them work for the end goal, which worked well with my new idea of gamification.
- 3 **Points & Rewards:** The list of modules is where all of the gaming elements come together and allow students to purchase their flashcards and tests or “rewards,” and view the number of coins they earn after completing “challenges”



# 3.3 INDIVIDUAL MODULES

- 1 **Questions:** Because the deepest level of depth-of-processing requires asking questions within the content, I thought it would be best to incorporate these questions towards the beginning of each module as objectives, so students know what information they are looking for. However, after discussing with real students, I found that many skip over course materials like this, but typically pay attention to quizzes. With this being said, I added depth with quiz questions throughout the course as an end to each module.
- 2 **Visual Weight:** When I began this experiment, I researched visual weight and found that adding visual weight to important parts of the course text would draw attention to themselves, and communicate the most important information. While the design of visual weight didn't change a lot throughout the project, a few articles said that making it a different color didn't work. With this being said, I was surprised when I sent a survey out at the end of this experiment and found that my visual weight made little difference in depth-of-processing and people got answers with visual weight as often as without it.
- 3 **Points and Challenges:** By posting the student's high score, I wanted the information design to "challenge" them to do better. While typical e-learning softwares already do this, the difference is in the second gamification element that awards users with "money" to purchase flashcards and tests.



# 3.4 ACTIVITY CARDS



**“Challenges:”** While many e-learning environments include images, videos, and external links in-line with the text to accommodate the second level of depth-of-processing, cards will take their place within the course modules. These activities will be assigned coin values based on how much interaction and attention is involved. Using those coins, they will then be able to purchase the study materials that they really want, such as tests and flashcards. This not only is a big part of the gamification of studying, but also creates an environment where students will feel that they have control over the information they consume, but teachers can manipulate it based on how many points they need to earn to get their “rewards.” During student interviews, they said that they would be more likely to pay attention to these elements, if they felt they were in control and were getting something “monetary” out of it.



## 4.0 Conclusion



# 4.1 WRAPPING THINGS UP

## USER FEEDBACK

After speaking with a variety of students, in different majors and different schools, many people communicated to me their interest in an app like this, because it would make studying more meaningful and “help them pay attention to the material.” After demonstrating the app further, I received positive feedback about the look and feel of the app as well as how it would work

## SURVEY

While my feedback on the gamified study concept and the overall design was positive, the survey I conducted at the end of project produced results that I validated and disproved my theories and reasoning of my design.

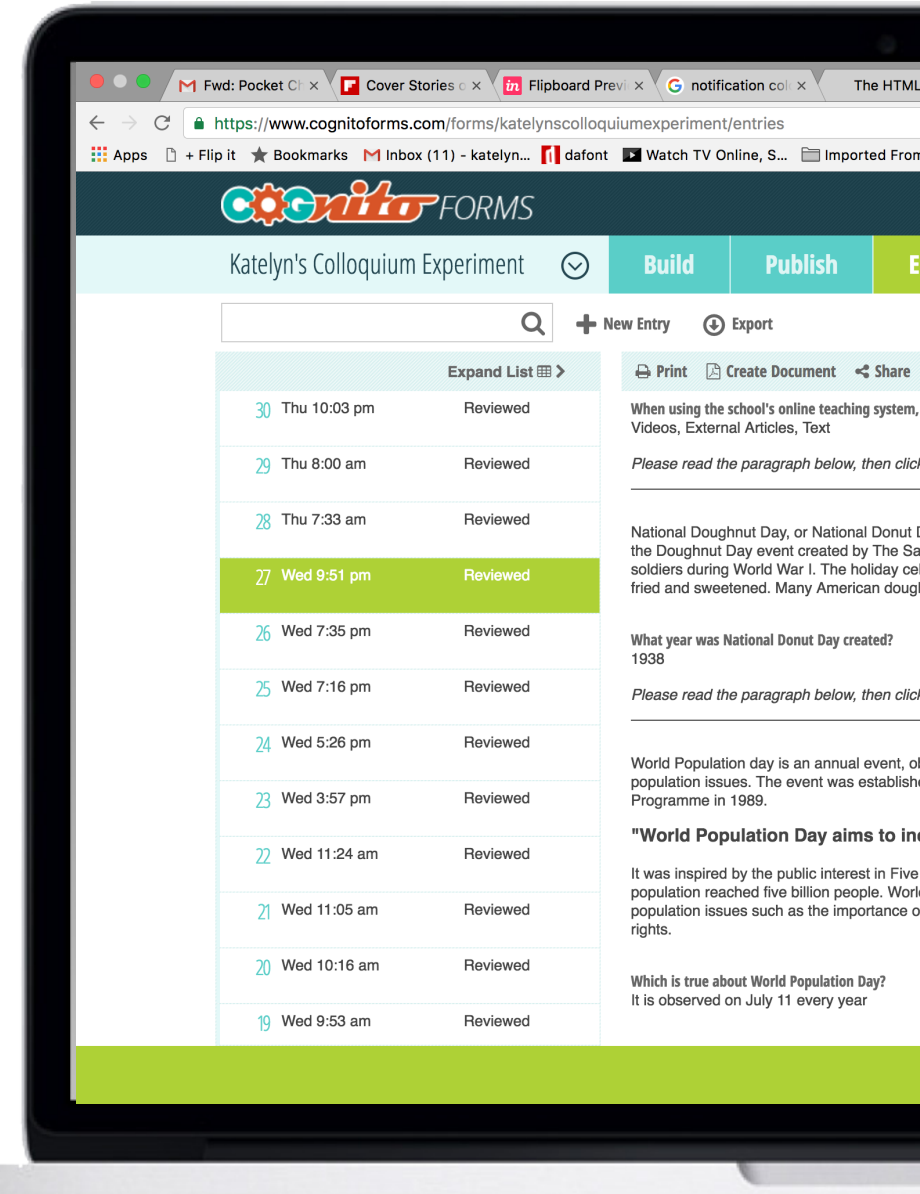
1. **Content:** When asking students what they type of content they learn the most from, the results in my favor were overwhelming. Videos, images, and text were said to be the most valued and effective in 100% of the surveys conducted, while only 50% viewed as the most effective type of e-learning content.

2. **Visual Weight & Serial Position:** While I thought that applying visual weight principles would draw attention to the most important information, my survey results showed that how text was formatted didn’t make as much of a difference as the serial position effect, or where the information is placed in the content.

## LESSONS LEARNED

1. **Research & Testing:** The most important lesson I learned doing this study was how important it is to not only research the competition, as well as the best ways to implement a design principle, but to also test it with real people. This is important because even if your research has been tested, your target audience and the usability and effectiveness of a design is unique to the context and environment.

2. **Look at parts, as well as the whole:** When it came to gamifying an e-learning environment, I learned that it is important to not only look at the overall principle, but to look at the pieces to decide what works and what doesn’t to accomplish the goals of a product. Similar to my design, specific elements of a guideline or “best practice” may work with your solution, while others may not be applicable and practical.





## 5.0 Appendix

# 5.1 PROJECT BRAINSTORM

iLearn/iTutor

**App1**



Quizlet

- flashcards
- customizable
- always on phone
- games
- student controlled
- term/definition

**App2**



Canvas

- teacher controlled
- test units
- boring
- doesn't always load

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**Solution**



- flashcards & games to study
- units w/ pages of various content
- teacher controlled so it's relevant
- interactive, variety of learning, fun!

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<p><b>Gamification</b> Application of game-design elements in non-gaming environment</p>	<p><b>Visual weight</b> Ability of a region or element in composition to draw attention through contrast or color</p>	<p><b>Cognitive Load</b> Burden on a person's short-term memory during a complex process</p>
<p>Make Learning Fun </p>	<p>Make <b>Important</b> stuff stand out</p>	<p>Modules reduce information </p>


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**Test Depth of processing**

Text



Video



Game



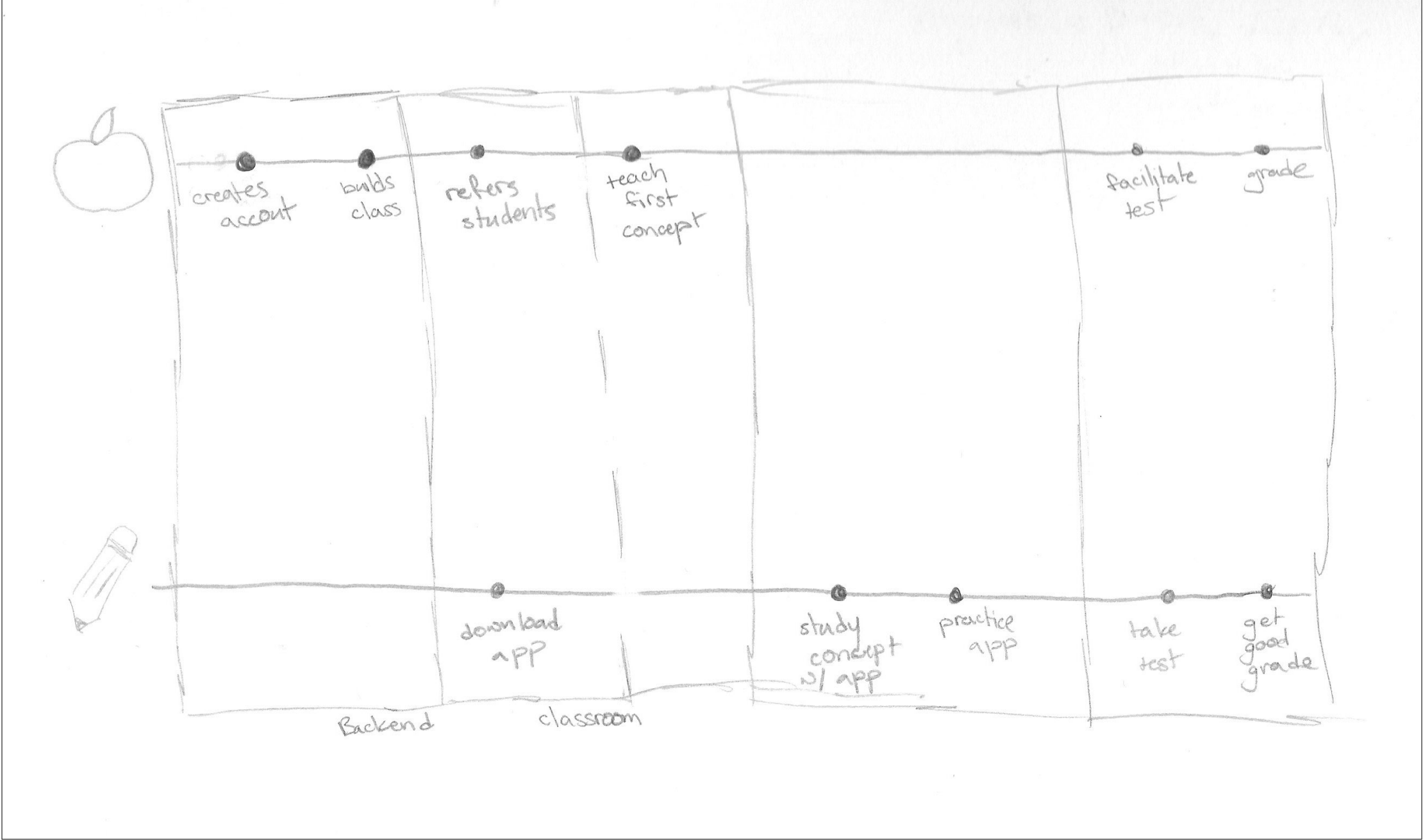
Quiz to test



# 5.2 CONCEPT MAP

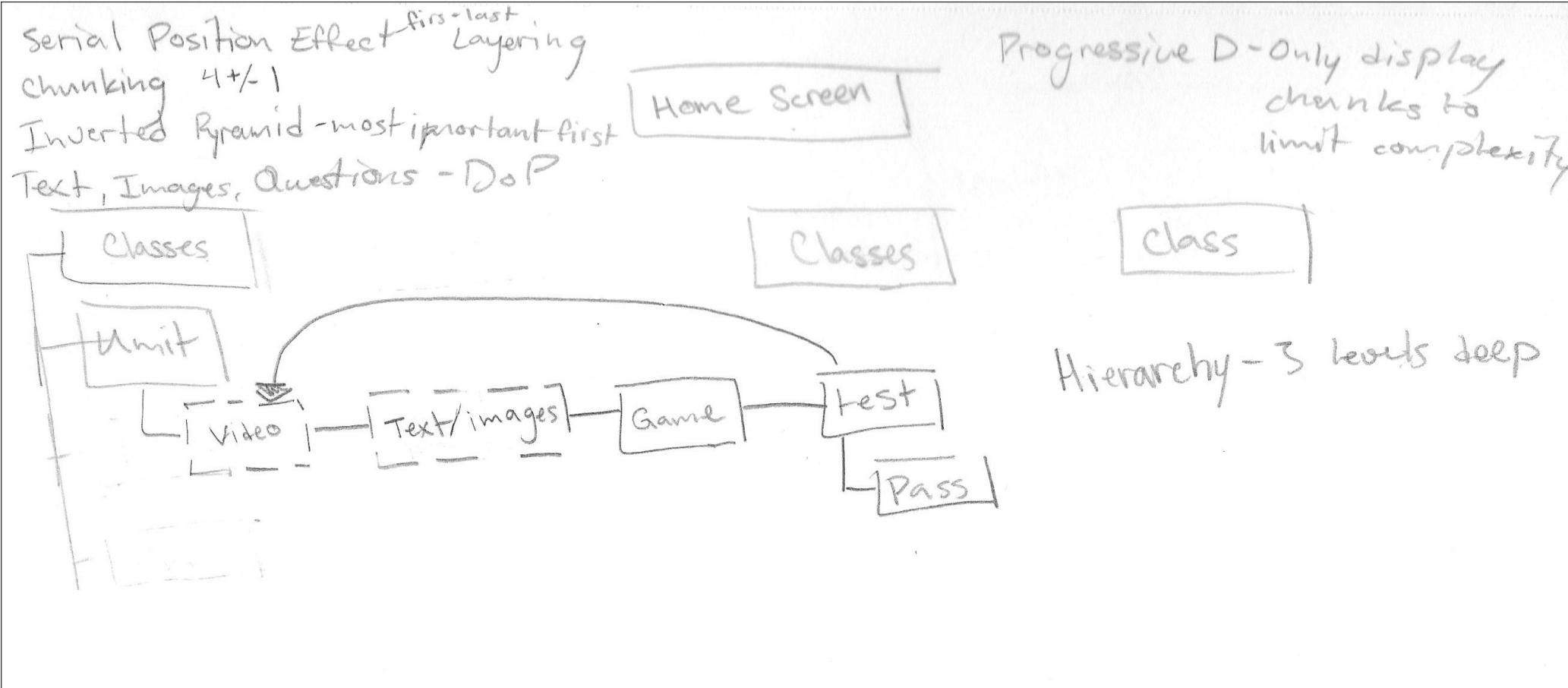


# 5.3 USER EXPERIENCE MAP



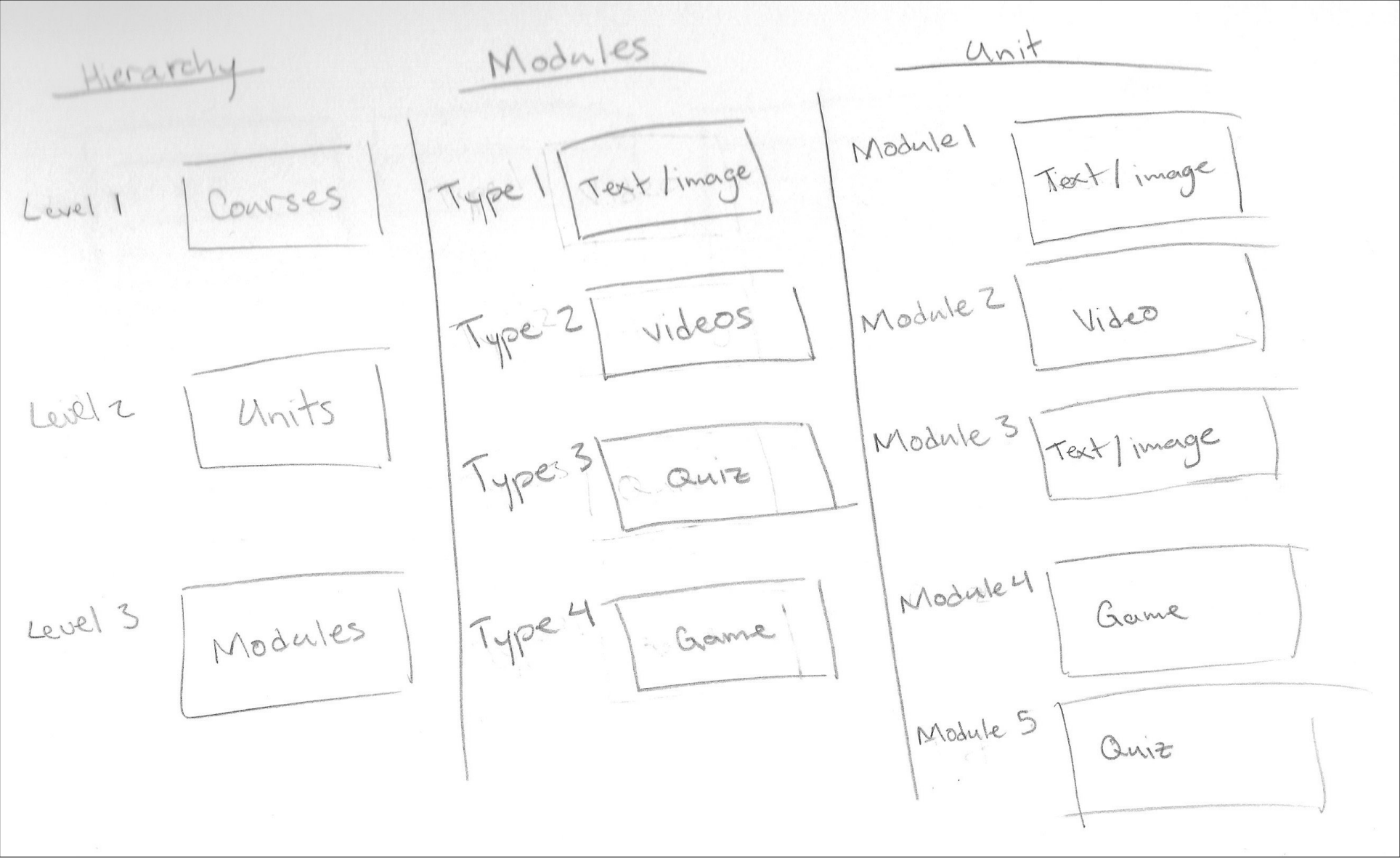
# 5.4 APP STRUCTURE

VERSION 1



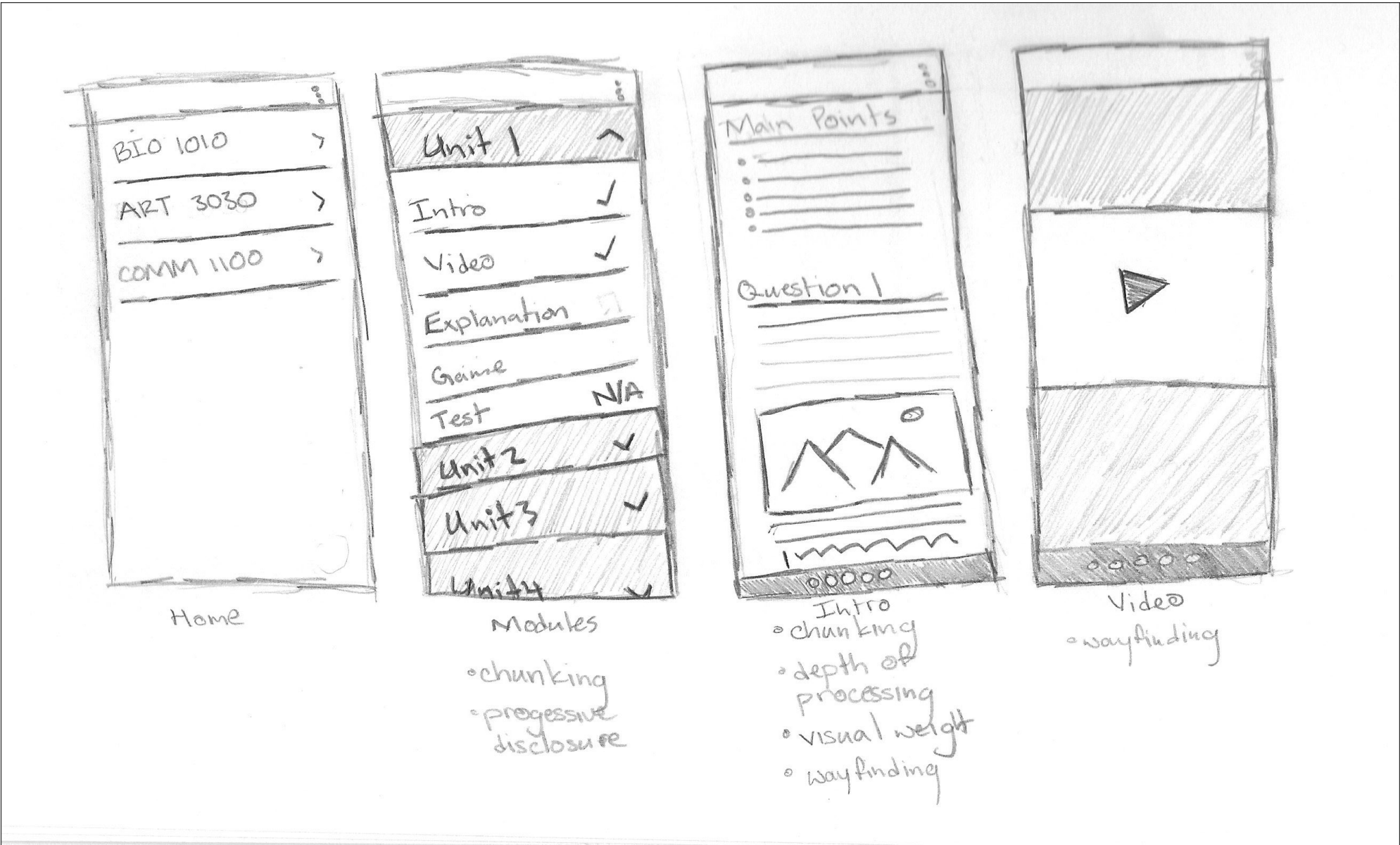
# 5.4 APP STRUCTURE *(continued)*

VERSION 2



# 5.5 SKETCHES

PAGE 1





# 5.5 SKETCHES (continued)

PAGE 2

