1.3 - Good Design Using Layouts & XML Attributes

OVERVIEW

In this lesson, students will discuss what makes good (and bad) design, both from an aesthetic perspective and from an ease-of-use perspective. Students will also review common XML methods to make app designs more organized, interesting, and visually appealing (LinearLayouts inside LinearLayouts, font size, colors, padding & margins).

NOTE: You may want to connect with a graphic design teacher at your school for a good intro lesson in combination with this lesson.

Estimated Duration: 1 day

STANDARDS ADDRESSED

CSTA Standards

- 3B-AP-24: Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
- 3A-AP-21: Evaluate and refine computational artifacts to make them more usable and accessible.
- 3A-AP-23: Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.

Maryland Computer Science Standards

- 12. AP.PD.07: Compare multiple programming languages or libraries and discuss how their features make them suitable for solving different types of problems.
- 10. AP.PD.03: Evaluate and refine computational artifacts to improve usability, accessibility, and efficiency
- 10. AP.PD.05: Represent the design elements and data flow (e.g., flowcharts, pseudocode, etc.) of the development of a complex program through the use of various visual aids and documentation techniques

UNDERSTANDINGS

Factual Knowledge	Procedural Knowledge	Conceptual Knowledge
Students will know: • The parts of Android Studio IDE	*Students will be able to:*	*Students will understand:*

• Basic Android terminology • Basic Android UI elements, their names and functions	• Write XML code for various UI elements within a *LinearLayout*	• How XML, Java, design & planning all contribute to a good app

ESSENTIAL QUESTION(S)

- What makes an app design "good"?
- How do we balance aesthetics and functionality in app design?
- How do user interfaces impact the experience of both the programmer and the end user?

OBJECTIVE

Students will critique designs and experiment with XML UI Elements and Attributes.

ASSESSMENT / PERFORMANCE TASK

Students try out new UI elements and add new attributes to familiar ones to experiment and learn. Gallery walk at the end of class as a formative assessment and for peer learning.

MATERIALS NEEDED

The basic course materials (computer, Android device, USB cable, internet access, screen projection/sharing system) are needed every day. Additionally, today you should make sure the following links all work and are accessible to students:

Readings

- XML Intro from W3schools

Tools

- XML-Android Visualizer from Udacity

Videos

- Bad Doors (warning: language)
- 10 Rules of Good UI Design
- Learn the Most Common Design Mistakes by Non-Designers
- Top 7 Mobile App Design Guidelines

LEARNING PLAN

	ACTIVITIES	SUGGESTED TIMING
1.3.1	Warm Up: Review of UI Elements	5 minutes
1.3.2	Discussion of Design Principles	10 minutes
1.3.3	Applying Principles of Good Design to XML	20 minutes

1.3.4	Experimenting with XML	20 minutes
1.3.5	Gallery Walk	5 minutes

ACTIVITY 1.3.1 - WARM UP

1. Ask students to list and state the purpose of each of the UI elements learned yesterday
2. Sample Answers:
    a. TextView - to display text
    b. EditText - for the user to enter text
    c. Button - for the user to click which will cause something to happen

ACTIVITY 1.3.2 - DISCUSSION OF DESIGN PRINCIPLES

1. Use some or all of the following questions to facilitate a discussion with students about design principles referencing the videos assigned for homework in Lesson 1.2:
    a. What stood out to you from the videos you watched last night for homework?
    b. What makes a good design?
    c. What makes a bad design?
    d. What makes a design creative?
    e. Is a good design universally agreed upon as good?
    f. What is the difference between functionality and aesthetics? Which is more important?
    g. What makes an app easy to use?
    h. What makes an app accessible?
    i. What are some population groups of users with special needs that should be considered in the design process?

ACTIVITY 1.3.3 - APPLYING PRINCIPLES OF GOOD DESIGN TO XML

1. Demo how to apply some of those design principles with XML:
    a. Show *Design View* vs. *Code View* of XML Layout Files
    b. Demo how to change/specify larger font size, font colors, alignment, other attributes
    c. Demo how to add margins and padding
    d. Demo how to organize your screen with nested *LinearLayouts*

ACTIVITY 1.3.4 - EXPERIMENTING WITH XML

1. Have students start a new app for experimenting with designs and layouts.
    - Alternatively, you can have them modify Hello, Name - either is OK.
2. Encourage students to play with XML elements...
    - including trying new UI elements not seen before just to see what they look like - no Java coding today
3. ...AND with the attributes for each UI element
    - including attributes discussed above and others not seen before

ACTIVITY 1.2.5 - GALLERY WALK

1. Students walk around to each others' screens to see what UI elements or attributes other students have experimented with.

HOMEWORK

As preparation for tomorrow's lesson which will be creating a scorekeeper app, ask students to respond to the following prompt:

- *In one paragraph, describe the rules of a sport or game that has two teams or two players. How is it played? How do the players/teams earn points?*