CHAPTER II

LITERATURE REVIEW

2.1 Interactive Media

Interactive media is regarded as any form of media that enables a two-way interaction between the user and the content of the media. Yasa, et al. (2017: 202) in (Agustini & Purnamawati, 2022) stated that interactive media allows control to the user who operates it to decide the desired outcome. The purpose of using interactive media is to interact with the users in ways no contemporary media could. Various implementations of interactive media have been used as a means of promotion, guidance, entertainment, or play (duniapendidikan, 2022). One of the uses of interactive media is informative media as a means of education. Sudjana & Rivai in Husna & Kuswandi (2017: 38) mentioned the benefits of interactive media for learning, including better motivation for students to learn, clearer meaning from learning through examples, and a more student-centered learning method, resulting in better student learning outcomes. Thus, it is concluded that interactive media is a medium that enables two-way communication, allows the user to control their desired outcome, and benefits the learning process of said users.

2.1.1 Mobile Application

Mobile Applications are one of the interactive media as it is a means of communication that enables the user to interact and control the information they receive. Cuello & Vittone in their book Designing Mobile Apps (2013: 12) define a mobile application as a software mainly designed to enhance personal productivity, like alarms, calendars, or calculators. However, as technology advances, mobile applications have become multifunctional. Mobile applications can be used as a business model, one of it being a means of education (Chawla, 2023). Mobile applications used for education can be a good alternative medium to practice personal finance for improving financial literacy among undergraduates. When compared to mobile websites, applications offer a better user experience, less wait time, and a more fluid

content navigation (Cuello & Vittone, 2013: 14). The writer believes by using mobile applications as a means of education, financial literacy among undergraduates can be improved with the education and practice of personal finance within the application designed.

2.1.1.1 Benefits of Mobile Learning

The development of learning using mobile technology is currently increasing significantly, and mobile learning through applications has impacted the culture. Mobile learning has great potential to improve learning quality and enhance student development (Briz et al., 2017). Furthermore, technological advancements cater more towards smartphones and wearables in daily human lives (Nacke & Deterding, 2017). This shows that mobile learning can be used as an effective alternative medium to enhance education, and can be applied in the design of a mobile application to improve financial literacy among undergraduates through personal finance.

2.1.1.2 Gamification in mobile learning

Interaction Design Foundation (2016) states that gamification is a method where a non-game application is enhanced with game elements. It is applied by transforming learning processes into a game or interactive experience, using game mechanics to engage users and encourage desired behaviors. Implemented elements such as achievements, levels, leaderboards, and rewards help improve user enjoyment, increase engagement, and in some cases, add competitiveness between users within the application. Xi & Hamari (2019: 2) mentions that the majority of studies related to gamification showed that it brings a positive effect on the motivations and behaviors of the users. This further proves the point that gamification can bring a positive impact to mobile learning.

A. Gamification Framework

Kevin Werbach and Dan Hunter in their Book “For The Win: How Game Thinking Can Revolutionize Your Business” (2012: 86),

defined a framework called the six steps to gamification. In the mobile application design, gamification is essential to keep the users entertained and consistent in using the application, especially for more serious topics like personal finance. Werbach & Hunter defines the process of creating gamification elements in six steps, define business objectives, delineate target behaviors, describe your players, devise activity cycles, don't forget the fun, and deploy the appropriate tools. This structured approach helps integrate game-thinking into products and systems to boost interactivity and long-term engagement. Each step will be defined in the points below:

1. Define Business Objectives

For effective gamification, it is essential to have a well-defined understanding of your goals, as unclear objectives can lead to failure (Werbach & Hunter, 2012: 87). In the first stage of gamification design, the key step is to clearly define the purpose of the gamification. This purpose should be specific and distinct, not just one of the game mechanics. In the mobile application design, the objective would be to increase financial literacy through the means of personal finance education.

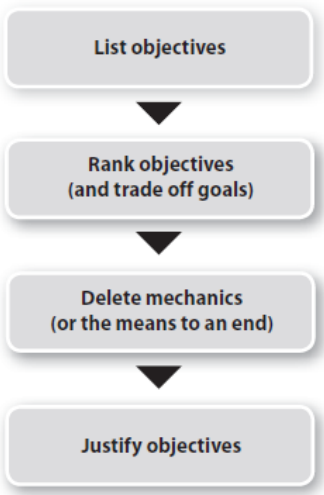

Figure 2.1 Define Business Objectives Scheme
Source: Werbach & Hunter (2012)

2. Delineate target behaviors

In the second stage of gamification design, the crucial step is defining the behaviors that the application users or players should exhibit. These target behaviors must be clear and specific, aligning with the previously established objectives. Once a list of desired user behaviors is created, a success matrix can be developed to measure and evaluate the outcomes effectively. In the mobile application design, the writer will be implementing the target behaviors in order to define the audience better.

3. Describe your Players

In the third stage of gamification design, mapping is conducted to ensure the system aligns with the intended user groups or target audience. Since not all gamification users are the same, this mapping process helps tailor the system to appeal to different types of user groups effectively. In the mobile application design for improving financial literacy among undergraduates through personal finance, the writer will be catering towards Gen Z as the "players".

4. Devise activity cycles

A game always has a beginning and an end, but in between, there are repetitions and branching paths (Werbach & Hunter, 2012: 94). In gamification design, an effective way to create an action model is by using activity cycles. These cycles in gamification are divided into two types: engagement loops and progression stairs. Engagement loops operate at a micro level, focusing on short-term interactions that keep users engaged, while progression stairs work at a macro level, guiding users through structured long-term progress within the gamification system. In the mobile application design, the application of engagement loops and progression stairs will be applied in order to enhance the gamified features of the application.

5. Don’t forget the fun

Before implementing the gamified elements, the fun factor of the gamification system must be considered. Every gamification system offers different types of fun, depending on its design and objectives. According to Dhikale Lazzaro in Werbach & Hunter (2012: 98), in gamification, there are four types of fun, each contributing to user engagement in unique ways, namely hard fun, easy fun, altered states, and the people factor. Hard fun describes the fun users feel after overcoming a difficult challenge, like puzzles. Easy fun, on the other hand, is a type of casual enjoyment where the users do not have to spend a lot of time overcoming difficult things. Altered states is when users experiment with new kinds of personas and have new experiences. Finally, the people factor refers to the fun resulting from social interactions, both cooperation and competition. In the design of the mobile application, the writer plans on implementing easy fun as the fun factor in the gamification. This way, users can enjoy personal finance without an extra burden to their minds on top of learning.

6. Deploy the appropriate tools

In the sixth and final step, the implementation of the gamified features will be done. This step involves implementing the previously designed steps into a tool or system that will support the gamification process. The tools used in gamification vary depending on the specific steps and objectives established earlier, ensuring the system functions effectively to enhance user engagement. In the mobile application design for improving financial literacy among undergraduates through personal finance, the final step will be the key factor in the practice of gamified elements in the app. The writer will also conduct testing to find some feedback regarding the users’ experiences with the gamification of the mobile application.

2.2 User Interface

Malewicz (2020: 16) in his book titled “Designing User Interfaces”, defines a user interface as the visual representation of a digital product. User Interface (UI) is commonly used in the design of applications and websites. UI helps users achieve what they expect through interaction with the system.

2.2.1 Elements of User Interface

. In designing a User Interface, there are elements that make up the application’s visuals. The user interface elements that the writer uses in the design of the app include screes, grids, icons, buttons, cards, graphs, forms, popups, and navigation. The said elements will be further described below:

1. Screens

In designing a mobile application, it is important to consider the average reach of the user’s fingers (Malewicz 2020: 53). Randomly distributed design elements can result in user frustration due to its inaccessibility to use with one hand, as typical mobile users do. In designing the mobile application for improving financial literacy among undergraduates through personal finance, the elements of the design will be spread accordingly to the screen reach figure based on its importance.

Figure 2.2 Screen reach distribution
Source: Malewicz (2020)

As users are most likely using the mobile application with one hand, assuming they are right-handed, the most important elements of the design will be placed in the bottom, leaning towards the bottom right. Then

the less important buttons can go higher, leading to less clickable features that stay on top. In designing the mobile application, the design of a bottom-aligned tab is highly recommended by Malewicz (2020: 53). Thus, the design for the mobile application will be applying a footer with the most clickable menus in order to reduce user frustration.

2. Grid

In Malewicz (2020: 56), grids are described as a structure of lines that keep the layout of the design together. A grid is a structural set of rules that subconsciously affect the design of an interface. The presence of a grid in UI is an essential element as it helps establish a visual hierarchy in design. One of the most commonly used grids in UI layout is the column grid, and the two types of column grids that are most frequently utilized in UI design are fluid grids and fixed grids.

In a fluid grid, the width of each column changes depending on the screen size. However, the margins and gutter between the columns stay the same. Fluid grids usually have larger margins to make room for adaptability across different platforms. On the other hand, a fixed grid has a fixed column width. In varying screen sizes, a fixed grid does not change its column width, but will instead create white spaces in the end of each margin to accommodate the screen size change.

Figure 2.3 Fluid Grids
Source: Malewicz (2020)

In designing the mobile application for improving financial literacy among undergraduates through personal finance, the writer will apply the fluid grid, as various mobile devices have various screen sizes. By using the fluid grid, the final design can adapt to said differences in screen sizes and result in a better user interface.

3. Icons

Malewicz (2020: 168) defines icons as a small pictogram that symbolizes either a function or a status. When designing icons for applications, several aspects need to be considered, such as the target users we define, the size of the icon and how it will appear, the context and location where the icon will be displayed, the purpose of using the icon for communication, the style of the icon, and whether the icon is part of a system. Icons must be relevant to the application being created so that they can function effectively.

Figure 2.4 Different styles of icons
Source: Malewicz (2020)

Essentially, the style of the icons should be kept consistent throughout a design (Malewicz, 2020: 172). The factors that determine the consistency of the icons include the level of detail, the fill or outline of the icon, the roundness of the icon, the tone of the icon, the legibility of the icon, and the size of the icon. To design consistent icons, a bounding box can help with sizing, as it is a safe area around the icon that can be used for irregular shapes to take more space in, thus easing the adjustments of icon sizes.

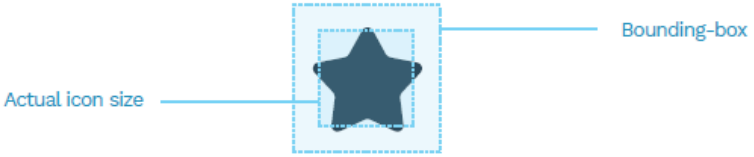

Figure 2.5 Bounding box
Source: Malewicz (2020)

4. Buttons

A button is an interactive element that describes the action written within it. Malewicz (2020: 179) stated that buttons should look like buttons, meaning that buttons should be familiar enough for the user to recognize it

as a button in order to execute the action the button is linked to. For example, if a button is labeled “save,” clicking it will allow you to save something. Buttons are also an essential element in UI design. The most common shape when designing a button is a rectangle or a rectangle with rounded corners, as they tend to be more easily recognized by users compared to other shapes like circles, triangles, or abstract forms.

Figure 2.6 Familiar shapes of buttons
Source: Malewicz (2020)

Buttons have different types based on their functions. Commonly used buttons are call-to-action (CTA) buttons, primary buttons, tertiary buttons, and icon buttons. CTA buttons usually consist of an action order, such as “Buy Now”, “Download”, or “Log In”. They usually have contrasting colors and show importance and urgency for the users to click on them. Primary buttons are not so different from call-to-action buttons, with both relating to an action for the user to execute using the button. However, primary buttons are usually for positive responses, get used more than once, and have less contrasting colors. These kinds of buttons usually represent the “OK”, “Next”, or “Yes” buttons. Tertiary buttons, unlike primary buttons, have the opposite usage, namely for less important actions or negative responses, such as the “No” button in a yes or no situation. Finally, icon buttons are buttons that are labeled with icons that are familiar for the users to understand the meaning behind the button without texts. Icon buttons can usually be found in shop buttons with a shopping cart icon, profile buttons with a user icon, or like buttons with a heart icon.

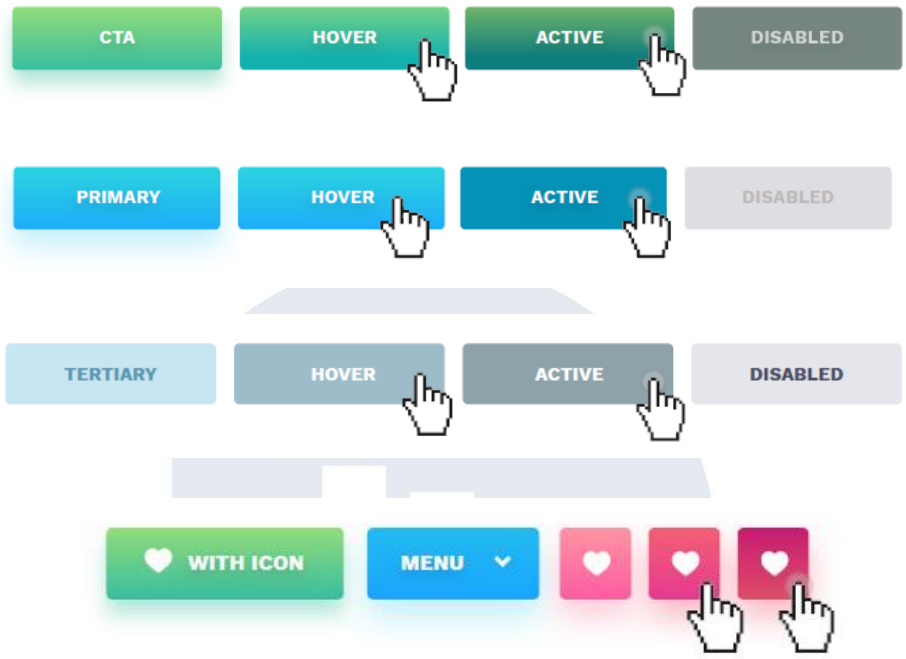

Figure 2.7 Different types of buttons
Source: Malewicz (2020)

In designing buttons, size matters, especially in mobile platforms. Malewicz (2020: 184) stated that buttons should have a set minimum size. He recommends starting with 44x44 points for all interactive buttons and gradually increasing the size for the more important buttons. A button should not be too small, otherwise users will get frustrated over being unable to click said button.

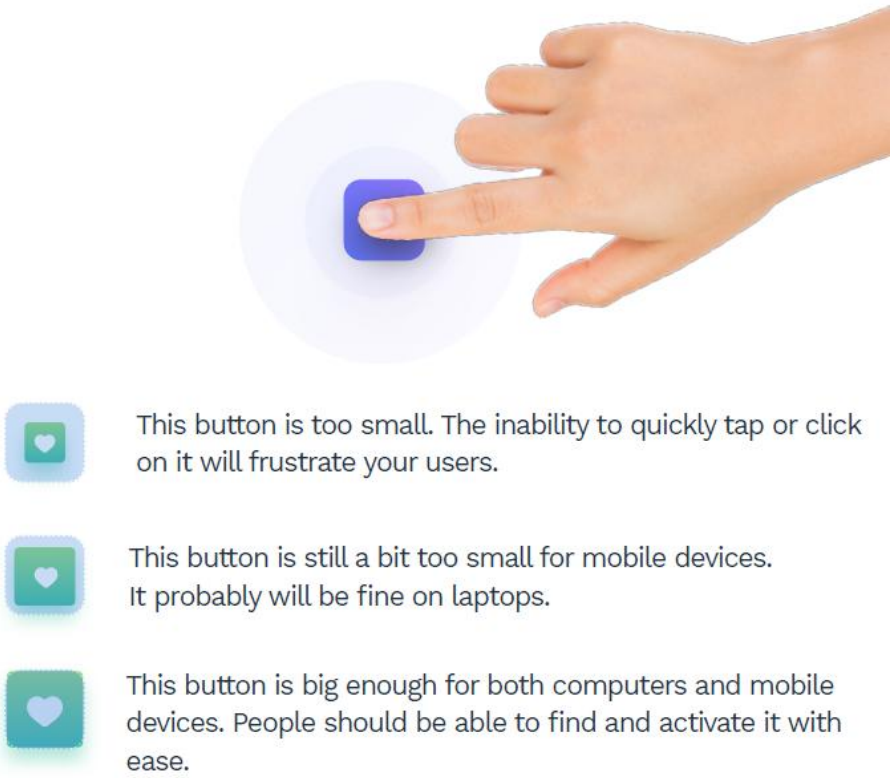

Figure 2.8 Button sizes
Source: Malewicz (2020)

5. Cards

Cards are one of the most common ways to show content in an interface. They can be used to display products, information, people, or actions (Malewicz, 2020: 204). When designing a card, it is advised to start by inserting the main content or key information to be displayed, then move on to detailing, like adjusting its position or refining the style. As human eyes find slightly curved edges more comfortable to look at compared to sharp corners, the cards that will be used will have rounded corners.

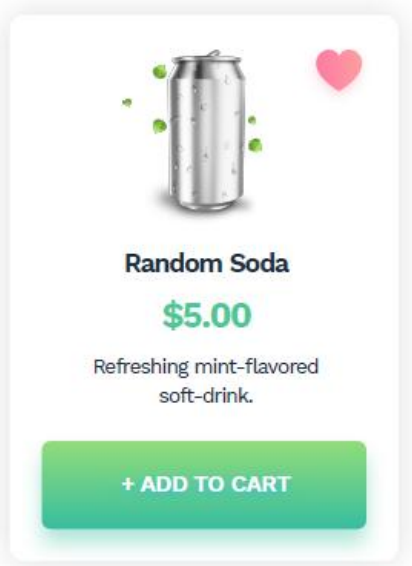

Figure 2.9 A card showing a product
Source: Malewicz (2020)

6. Graphs

Graphs are another way to show content in UI design. They usually present and summarize large amounts of data. In the app design, graphs are used to present data like summaries of spending in a way that is easier for users to understand. The type of graph used in the design is filled graphs, consisting of pie charts or bar graphs. Malewicz (2020: 219) mentioned that clarity is more important than the amount of data that can fit in the screen. Clarity comes from several factors like typography, whitespace, colors, and separators (i.e., lines).

Figure 2.10 Example of a Bar Graph and a Pie Graph
Source: Malewicz (2020)

7. Forms

Forms are a set of labels and fields where users can manually enter information, which is then stored in a database after pressing the button at the end. The usage of forms in UI design for the app is for the user to

input data in login forms, or transaction details. In the design, forms include text fields, text labels, dropdowns, buttons, and rectangular-style fields.

Text fields are the space for the user to input the text they desire in the form. Text fields come in various shapes, the most commonly used one being rectangular. Along with text fields, there usually comes a text label, used for describing the function of the field. The figure below shows an example of rectangular text fields and text labels.

Figure 2.11 Rectangular text fields and labels
Source: Malewicz (2020)

Dropdowns are extensions of the forms that let the user pick what to input in the form rather than type it manually. It is commonly used with icon buttons like the up/down arrow or "X" icon to indicate the usage of dropdowns in the label. Button icons in forms is also commonly used in application UI design. Common usages of buttons in forms are the visibility toggle button, which is represented with an eye icon, and the search button, that is represented with a magnifying glass icon.

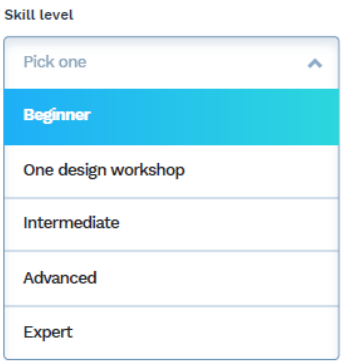

Figure 2.12 A dropdown form
Source: Malewicz (2020)

8. Modals and Popups

Popups, overlays, and action sheets are three examples of UI components that appear on top of the interface. These modules sometimes appear automatically or as a result of the user's action. According to Malewicz (2020: 262), using these kinds of elements repeatedly should be avoided, as they may be frustrating for the user. However, with proper "X" icon sizes, a slightly dark background overlay, and clear action hierarchy, these modules are going to help enhance the user interface of the app.

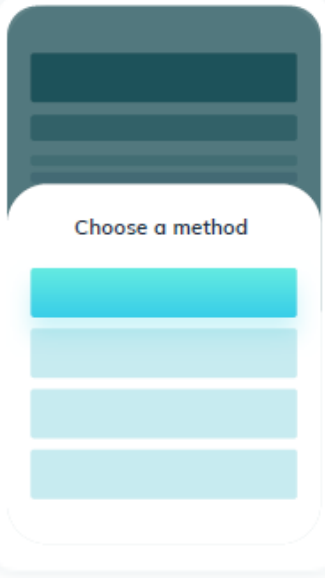

Figure 2.13 An example of an overlay
Source: Malewicz (2020)

9. Navigation

Navigation is an important element in UI design, as poor navigation can confuse users when operating the application. According to Malewicz (2020: 281), there are three types of navigation: visible, hidden, and contextual. In the design of the application, the author will be using visible navigation. This type of navigation is used because it is the most effective for mobile applications. The best place to position a navigation bar in a mobile application is at the bottom edge of the screen, allowing users to easily reach it with their fingers. In the navigation bar design, a labeled tab

bar will be used, as labeling navigation icons makes it easier for users to recognize which menu tab they are currently on.

Figure 2.14 Visible labeled navigation bar
Source: Malewicz (2020)

2.2.2 Principles of User Interface

. Mayhew (2008) in Hartawan (2021: 13), describes the fundamental user interface principles commonly used in design. There are 17 general principles of UI design, namely user compatibility, product compatibility, task compatibility, workflow compatibility, consistency, familiarity, simplicity, direct manipulation, control, WYSIWYG (What You See Is What You Get), flexibility, responsiveness, invisible technology, robustness, protection, ease of learning, and ease of use. These principles will be described in more detail in the following points.

1. User Compatibility

User compatibility refers to an interface design that is tailored to the user. In “The Essential Guide to User Interface Design” by Galitz (2007:47), the author explains that UI design must align with user needs and preferences. This is because users have different requirements, aspirations, and attitudes compared to developers. To create an effective design, the process should begin with "know the user", which means understanding their perspective and applying a user-centric approach.

This principle of user compatibility is used in the mobile application design. By considering user interactions, the design must feature simple navigation to ensure an efficient experience. Applying this principle allows users to operate the application according to their specific needs, enhancing both comfort and effectiveness.

2. Product Compatibility

Hartawan (2021: 14) mentioned that the design must have a consistent appearance for both general users and expert. In a new system

design, the target users are usually those who have used previous versions of the system. For example, in designing the mobile application for improving financial literacy among undergraduates through personal finance, the design is targeted towards people who have used mobile applications before. As a result, their habits, expectations, and knowledge are already formed and carried over when learning the new application. Therefore, maintaining consistency across the product is essential. By designing a new application that aligns with existing applications, users can utilize their prior knowledge while reducing the need to learn new functions (Galitz, 2007: 47).

3. Task Compatibility

Task compatibility means that the system functions must align with its interface (Hartawan, 2021: 14). The structure and flow of features should assist the users in executing their tasks more easily. This means that users should not be forced to navigate through multiple screens just to complete a task (Galitz, 2007, p.47). In designing the mobile application for improving financial literacy among undergraduates through personal finance, it is crucial to prioritize ease of access to information. Users who have never managed their personal finances should be able to learn and start managing their finances with the application designed. Therefore, the task compatibility principle is essential in the design because it allows the users to obtain information through simple and sequential steps.

4. Work Flow Compatibility

Work Flow compatibility refers to a system that can provide a single interface for completing multiple tasks, but only when those tasks are similar. This principle can be applied in the design of the mobile application in the next and back buttons that may appear in certain interfaces. Additionally, applying a uniform design helps users complete tasks quickly without confusion.

5. Consistency

Hartawan (2024: 14) mentioned that the designed system must apply general principles consistently. Consistency is a fundamental rule in all aspects of design, like uniformity in appearance, placement, and user interface behavior. The importance of consistency in a system is to reduce the learning curve for users by allowing them to apply familiar skills learned in one situation to another similar context. Galitz (2007: 48) stated that users perceive a system as a whole. Thus, the system must look, behave, and feel uniform for them. In the design of the mobile application, consistency is important in creating a smooth user experience. With a consistent layout and navigation, users can easily find information without needing to relearn how to use features across different pages. Consistent design, both in visual elements and functionality, is pleasing for the users to look at and helps the users navigate the mobile application efficiently to obtain the information and do their tasks easily.

6. Familiarity

Familiarity can be defined as making use of users' existing knowledge, primarily based on their real-world experiences. The interface should be designed using terms, workflows, and structures that are already familiar to users. The icons of the interface should mimic how users naturally act, while its dialogue and tone of voice should reflect the way users think and communicate (Galitz, 2007: 51). In the mobile application design, the principle of familiarity is going to be applied to ensure ease of use for users. Using relatable icons and familiar interface elements allows users to navigate the system effortlessly without needing to relearn its functionality. As a result, the application can create a smooth experience, making it easier for users to find the information they need.

7. Simplicity

Every design should provide default options for each task. A design is considered simple when all users can understand and use the system with no prior experience, adequate literacy skills, and minimal

concentration levels. To add, Gallitz (2007: 56) mentioned that systems with fewer features are often more effective than those with excessive functionalities, as too many features can create a complex and difficult-to-use interface. In designing the mobile application for improving financial literacy among undergraduates through personal finance, it is important to apply a simple design approach. By focusing features on users' primary needs, the interface becomes more intuitive and user-friendly. This allows users to concentrate on essential functions, such as learning how to start managing their finances, without being hindered by an overly complicated system.

8. Direct Manipulation

Direct manipulation refers to performing commands directly through shorter steps (Hartawan, 2021: 14). A task should be completed using visible alternatives, reducing user workload. Users can carry out tasks by selecting an object directly, choosing the action to be performed, and observing the system's ongoing operation (Galitz, 2007: 50). In designing the mobile application for improving financial literacy among undergraduates through personal finance, this principle can be applied to allow users to perform actions more efficiently. For example, the interface may provide a ”quick picks” button that connects to another screen so that users do not need to take extra steps to navigate. This enhances ease of access, enabling users to quickly obtain the necessary information.

9. Control

Providing users with full control is important due the human nature to prefer minimal restrictions in their interactions (Hartawan, 2021:14). By allowing users to customize the interface, they can perceive that the system is responding to their actions. Galitz (2007: 49-50) also mentioned that a system that offers full user control and can be navigated and operated smoothly by the user on their own is a well-designed system. In the application design, the only limiting control is when the user starts off with the tutorial. The user also may have the option to skip the tutorial and

may freely control the app. This flexibility enables users to adjust the interface or features based on their preferences and needs. As a result, they feel comfortable and engaged in the system.

10. WYSIWYG (What You See Is What You Get)

An interface design should provide visuals that resemble real-life experiences, ensuring that features function according to their intended purpose. When designed to mirror elements from users' everyday experiences, the interface helps them better understand functions and navigation within the mobile application. In the mobile application design, incorporating familiar features to support user workflows enables smooth task completion without difficulties.

11. Flexibility

Hartawan (20201: 14) stated that flexibility refers to a system's ability to respond to individual user differences. Through flexibility, users can choose interactions that best suit their situation and needs. A flexible design can be seen in various ways of accessing features and completing tasks. In designing the application, accessibility of information must be prioritized. This ensures that users can quickly obtain necessary details. Therefore, a flexible interface allows users to adjust the display according to their preferences and needs.

12. Responsiveness

An interface must respond to every user action (Hartawan, 2021:14). User requests or actions should be handled quickly, as responsiveness shapes user performance and builds trust. Every user request sent to the system must be acknowledged in some way. This can be done through visual feedback or messages, allowing users to see that their request is being processed (Galitz, 2007: 55). In designing the mobile application for improving financial literacy among undergraduates through personal finance, it is essential to ensure system responsiveness to every user action. The interface should provide clear and timely feedback, whether through visual cues such as highlighted text and icons or status messages that pop

up after a task is completed. This way, user confidence and comfort can be enhanced, making interactions smoother and more reliable.

13. Invisible Technology

Users do not need to understand the algorithms behind an interface (Hartawan, 2021: 14). In interface design, users should focus on completing tasks without being concerned with the underlying mechanics. They should not be required to think about technical system details, and instead, the design should guide them toward their intended task (Galitz, 2007: 57). In the application design, the system must be structured so that users can focus solely on their tasks. The technical mechanisms behind the system, such as data processing algorithms, should remain hidden from users. This ensures that users only see relevant results that match their requests, without needing to worry about how the system operates behind the scenes.

14. Robustness

An interface must be reliable in handling user issues to prevent errors or system crashes (Hartawan, 2021: 14). A robust system design is going to be created in the mobile application design, ensuring users can search for information without disruptions. By maintaining system reliability, users can easily access information without encountering technical difficulties that hinder their search process.

15. Protection

Hartawan (2021: 14) mentioned that actions that protect users from common mistakes involve providing features such as 'undo' or 'back', allowing users to revert previous actions. Users frequently make unavoidable errors, and the system must be designed to accommodate these mistakes. It should enable users to review, modify, and cancel actions whenever necessary. In designing the mobile application for improving financial literacy among undergraduates through personal finance, implementing features like an 'undo' or 'back' button enhances ease of use. This ensures that users feel safe and confident while navigating the system.

By offering clear recovery options and guidance, the interface helps users avoid frustration and maintain smooth interactions.

16. Ease of Learning

An interface design must be easy for users to learn (Hartawan, 2021: 14). In the mobile application design, the interface should be structured to ensure straightforward navigation, allowing users to quickly understand how to search for information. Additionally, the system must enable users to explore the interface without requiring excessive guidance while still providing easy access to the information they need.

17. Ease of Use

An interface system must be easily understood and used by its users (Hartawan, 2021: 14). This principle is essential in designing the mobile application for improving financial literacy among undergraduates through personal finance, ensuring that users can quickly locate the information they need without confusion. A simple and clear interface helps users understand all available features, bolstering ease of use and making navigation more intuitive and accessible.

2.3 User Experience

Malewicz (2020) mentioned that User Experience (UX) refers to the level of ease with which a product can be used. In digital products like mobile applications, this includes interface usability, navigation clarity, and effective communication. The primary goal of UX is to create products that are easily accessible to users across all social classes, age groups, and generations.

2.3.1 User Experience Framework

. In his book "The Elements of User Experience: User-Centered Design for the Web and Beyond," Jesse James Garrett (2011: 27) states that to design a strong User Experience (UX), there are five planes that make up the framework, namely surface, skeleton, structure, scope, and strategy. The way to read these planes starts from the bottom layer, then upwards, beginning with

abstract concepts in the strategy phase and progressing toward more concrete elements in the surface phase.

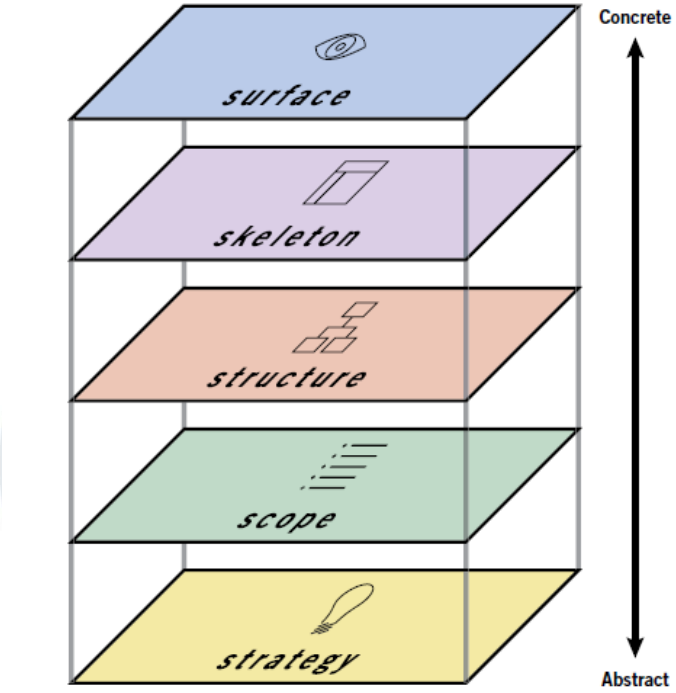

Figure 2.15 Five Planes of User Experience
Source: Garrett (2011)

1. Strategy

The Strategy plane is the initial and most critical stage in the framework, as it requires designers to determine the goals of the design and the needs of the target users. At this phase, designers must define target segmentation, like demographics, geographics, and psychographics. Then, it is also advised to conduct user research to better understand the target users. Methods used can be surveys, interviews, or focus group discussions. Once user data has been gathered, a user persona will be made to ensure focus on the primary needs of the target users throughout the design process of the mobile application design for improving financial literacy among undergraduates through personal finance.

2. Scope

The Scope plane is where designers establish clear boundaries for the design process, making sure that it remains focused on the scope decided

beforehand based on data gathered during the strategy phase. This allows the creation of content types and products that align with the defined target audience, ensuring relevance and effectiveness in meeting user needs. In the mobile application design, the scope of the design will be decided after conducting user research, ensuring a more defined user segmentation, resulting in a more effective design.

3. Structure

The Structure plane is the third layer in the framework, where the design process transitions from abstract concepts to concrete elements that shape the User Experience. At this phase, the designer must systematically define how information is presented within the application and determine the user's interaction experience when engaging with the mobile application. The planning process for the mobile application design for improving financial literacy among undergraduates through personal finance can be organized structurally using an Information Architecture and a User Flow to better define the system of the application.

4. Skeleton

The Skeleton plane is defined by three key elements: interface design, navigation design, and information design (Garrett, 2011: 30). Interface design involves selecting layout elements and placing them on the screen to enhance usability, making sure that users can complete tasks effortlessly without being confused. Navigation design is crafted to help users move seamlessly from one page to another and must be designed intuitively to avoid misdirection. Navigation design is often presented through site maps, which provide a comprehensive view of the information architecture of a website or application. Information design focuses on structuring content in a way that makes it easy for users to understand, ensuring clarity in how the information is delivered. In the application design, wireframes and low-fidelity interfaces will be made in order to shape the skeleton of the User Experience before finalization of the design.

5. Surface

The Surface plane is the final layer in the framework created by Garrett. At this level, the design aims to stimulate human senses like hearing and sight on an audiovisual level. Hearing can be stimulated from sound elements, such as keyboard feedback sounds on digital keyboards, mimicking the typing experience on physical keyboards, or notification sounds mimicking the dings of a bell. Sight is engaged through layout placement, color schemes, typography choices, design composition, and overall style, all working together to create a visually appealing interface that enhances user interaction and experience.

2.3.2 Principles of User Experience

To create a design that the users can enjoy, there are user experience principles to follow. (Santoso, 2023) explains that the application of UX principles in design ensures that users have a continuous and positive experience. Following that, he adds that some key UX principles include design consistency, intuitive navigation, and responsiveness.

1. Design consistency

Design consistency is essential in interface development, ensuring all interface pages in a design maintain a uniform appearance and behavior (Santoso, 2023: 8). This principle helps users adapt to a product seamlessly, reducing the learning curve and enhancing usability. In the mobile application design for improving financial literacy among undergraduates through personal finance, maintaining consistent design elements across all pages allows users to quickly recognize and understand how to navigate the application and retrieve information efficiently.

2. Intuitive navigation

Santoso (2023: 8) also mentions that the key to effective design lies in an easy-to-use navigation. Users must be able to navigate, locate information, and perform various actions without confusion. Easy-to-use

navigation can be in the form of visible navigation bars and burger buttons that can help lead the user to different pages seamlessly. In the mobile application design, it is crucial to ensure clear and intuitive navigation structures. A well-structured and easily understandable design enables users to learn and practice personal finance through the application with ease.

3. Responsiveness

A design must respond quickly to user actions to ensure a smooth experience. If user actions take too long to process, they may experience frustration, leading to discomfort and reluctance to continue using the product (Santoso, 2023: 8). In the mobile application design, responsiveness is highly important. Users should be able to access necessary information quickly and without disruptions. By applying strong responsiveness principles, the system can create a positive user experience, boosting trust and satisfaction in the interface.

2.4 Design

Poulin (2012) stated that designers must have basic knowledge regarding graphic design language. These languages refer to elements and principles of design, such as dots, lines, shapes, color, layout, typography, illustrations, etc. Said visual languages are applied in the design process by the designer. Several major elements used in the mobile application design will be mentioned below:

2.4.1 Color

Richard Poulin in his book "The Language of Graphic Design" (2012) mentioned that one of the most powerful and communicative elements in graphic design language is color. He also added that the uses of color include attracting attention, grouping disparate elements, reinforcing meanings, and enhancing visual compositions. With color, a designer creates meanings and enhances objects of attention for their designs.

2.4.1.1 Color Properties

.Colors are made out of several properties. By having properties, colors can be differentiated and have functions depending on their properties. According to Poulin (2012), the three properties of color are hue, saturation, and value. The following points will further describe the color properties.

1. Hue

Hue refers to the purest form of a color. It can be described as the perception that occurs when light is reflected from an object, allowing the human eye to distinguish one color from another when compared side by side. Colors without hue like black, white, and gray, are categorized as neutral colors. A hue may possess a range of color temperatures, from warm to cool. For example, a warm hue like red can be made cooler by mixing it with blue. When warm and cool hues are used together in a design, the elements may appear visually separated.

2. Saturaton

Saturation describes the vividness or dullness of a color. It is influenced by the degree of gray present in a hue. A highly saturated color appears bright and intense, conveying a sense of energy and playfulness. Such colors are effective for capturing the viewer's attention. On the other hand, low-saturation or desaturated colors tend to feel restrained and muted. These are often suited to designs that emphasize functionality and efficiency. Within desaturated tones, brighter hues can appear more friendly and approachable, while darker tones evoke a more formal impression.

3. Value

Value refers to the lightness or darkness of a color. The value of a color is determined by the intensity and amount of hue it contains. In design, value plays a crucial role in directing the viewer's attention and creating a sense of movement. Moreover, it can be used to evoke the illusion of distance and depth within visual elements. Neutral colors significantly influence the representation of value. Adding white to a hue results in a

lighter version known as a tint. Colors with a high concentration of white are referred to as pale colors, often associated with calmness or romantic moods. On the other hand, incorporating black into a hue results in a darker variation, known as a shade. Colors dominated by black are known as dark colors, which can create a sense of spatial constriction and convey focus or seriousness. Colors composed of a balanced hue without white or black are categorized as bright colors. These tend to attract attention and evoke a sense of joy and liveliness.

2.4.1.2 Color Wheel

. To illustrate color theory, Poulin (2012) used a color wheel that represents twelve colors: three primary colors, three secondary colors, and six tertiary colors. The color wheel also illustrates different relationships between colors.

Figure 2.16 Color Wheel
Source: Poulin (2012)

1. Primary Colors

Primary colors are base colors that cannot be obtained by mixing other colors. These colors become the base for other colors through color mixing. Primary colors include red, blue, and yellow.

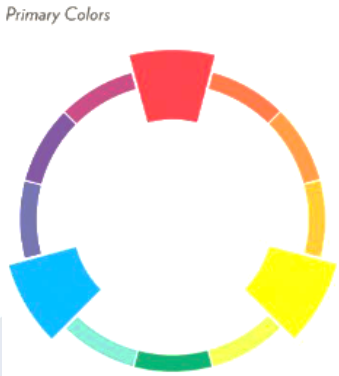

Figure 2.17 Primary colors
Source: Poulin (2012)

2. Secondary Colors

Colors that are the result of two primary colors mixed are called secondary colors. Blue and red will mix to purple, red and yellow will mix to orange, and yellow and blue will mix to green. These colors will later be used again in the makings of tertiary color.

Figure 2.18 Secondary colors
Source: Poulin (2012)

3. Tertiary Colors

Tertiary colors are colors that are produced by the mixing of primary colors and secondary colors. They are commonly just slight variations of said colors, like a greenish yellow or bluish purple. In the color wheel, they are commonly located in between secondary and primary colors.

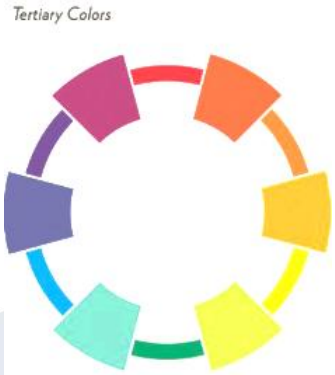

Figure 2.19 Tertiary colors
Source: Poulin (2012)

4. Complementary Colors

Complementary colors are a kind of color relation that is located directly on opposite sides of the color wheel. These colors are the opposite of each other, like blue and orange or purple and yellow. Using these colors together in design may create a sense of contrast.

Figure 2.16 Complementary colors
Source: Poulin (2012)

5. Monochromatic Colors

Monochromatic colors are made when a color gets mixed with white and black. Mixing white or black on a color results in a lighter or darker version of said color. Monochromatic colors tend to give a sense of consistency when used in design due to the similarities in color.

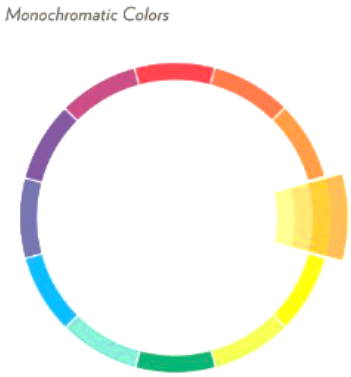

Figure 2.20 Monochromatic colors
Source: Poulin (2012)

6. Analogous Colors

Multiple colors that are right next to each other in the color wheel are called analogous colors. This relation of color usually results in a gradient of colors, for example, red, orange, and yellow. These colors tend to mix well as they have similarities and are located closely in the color wheel.

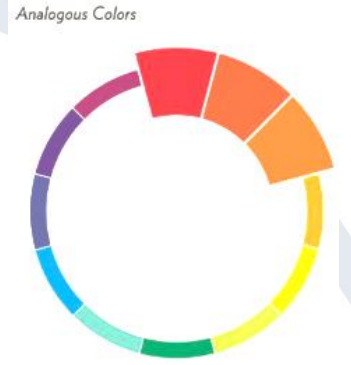

Figure 2.21 Analogous colors
Source: Poulin (2012)

7. Triadic Colors

Triadic colors are a relation of colors that are located in three different points that make an equilateral triangle when connected in the color wheel. Technically, one can say the primary or secondary colors have a triadic color relation as they are three colors that are located in three different points in the color wheel that make an equilateral triangle when connected.

Figure 2.22 Triadic colors
Source: Poulin (2012)

8. Quadratic Colors

Quadratic colors are a relation of four colors in the color wheel. Similar to triadic colors, quadratic colors resemble a square shape when the 4 colors are connected in the color wheel.

Figure 2.23 Quadratic colors
Source: Poulin (2012)

2.4.1.3 Color Psychology

. Malewicz (2021) mentioned the usage of colors in designing user interfaces. By using different colors, interfaces can influence users in different ways. In designing an interface, different colors are commonly used in different sectors of the model, which signifies a meaning in the users' psychology.

For example, in Malewicz (2021), the color blue is mentioned as the color of calm and relaxation. It's often associated with trust, professionalism, experience, or wisdom. Blue is commonly used in IT,

finance, banking, health, and social media. However, it is also mentioned that most shades of blue may not be the best choice for Call to Action and accents due to its calm nature.

Green represents health, nature, calm, and relaxation. Depending on the shade, green may express emotions like harmony, stability, growth, security, or energy. It is commonly used in IT, finance and banking, health, fitness, ecology, and food. Green is highly noticeable and visually distinct, making it effective for drawing attention. It conveys a sense of positivity and encourages users to take action, which is why it's frequently used for call-to-action (CTA) buttons. In user interfaces, green is commonly used to indicate success or the completion of a task.

In the book, Red is related with both positive (energy, passion, strength, love) and negative emotions (danger, adrenaline, warning, aggression). It is most commonly used as the main color for sports, food, services, cars, and telecommunications. However, using red has its drawbacks. Red may be able to attract attention, but it may signify a negative action. Despite being a distinct color for CTAs, using red is risky since in user interface design, red is commonly associated with errors or warnings.

Yellow represents mainly positive emotions, as it is associated with the sun, warmth, and gold. It commonly signifies enthusiasm, self-confidence, happiness, optimism, and fun. However, it is also a warning color that users may react to subconsciously. Malewicz (2021) mentioned that yellow is popular in industries like food, sales, creative services, and art due its positive representation.

Orange is an energetic and optimistic hue. The color calls for action and symbolizes activity, commonly associated with associated with youth, energy, creativity, fascination, and activity. It is also mentioned that in digital products, orange is a good choice for accents and CTAs, because

it's not as aggressive as red or yellow. This also means that orange is not as associated with risk as much as red or yellow.

Pink is associated with women, motherhood, innocence, youth, romance, and gentleness. It can also mean naivete and childishness. Pink is generally used for feminine models or products targeting women. Pink is popular with the cosmetics industry, fashion, pregnancy, female health, foundations, and non-profits due to its feminine nature.

Purple is mentioned as a rarer color used in UI design according to Malewicz (2021). Purple means luxury, power, wealth, and secrecy. Other meanings of purple include professionalism, wisdom, trust, high quality, and modernity. Purple is most popular in the IT industry, luxury goods, finance, banking, and food. However, it is not recommended to use monochromatic purple as it may be a bit overwhelming when used extensively.

Black and gray are serious, formal, and emotionally neutral colors. They are associated with elegance, minimalism, professionalism, and luxury. However, using too much black or gray shades may induce depression, due to its usage for wireframes or disabled buttons.

White is the most common color used to design backgrounds, margins, card, text boxes, and drop-down lists. White is also used in the design principle white space, which is the separation of elements that set hierarchy and order in design. Due to being the brightest of all colors, it is often associated with clarity and sterility. The usage of white as the main color of a product is popular in architecture, art, and fashion

2.4.1.4 Color in UI/UX Design

. In designing a user interface, colors influence UI components like buttons, cards, dropdowns etc. The colors used in the elements indicate relation with other elements, consistency in the design, and contrast for

better clarity, resulting in a better user experience. According to Malewicz (2021), the following are influences of colors in designing user interfaces.

1. Color palette

Malewicz (2021: 109) defines a color palette as a set of colors that work well together, combined to form a brand or a concept. A color palette helps set a mood for the final design. A color palette includes a primary, secondary, and accent colors (Soegaard, 2025). Primary colors are the colors that show up the most in the interface, while secondary and accent colors are colors that show up along with the primary colors that highlight and distinguish different parts of the interface. The color palette is chosen based on the relations between colors like monochromatic, analogous, complementary, etc.

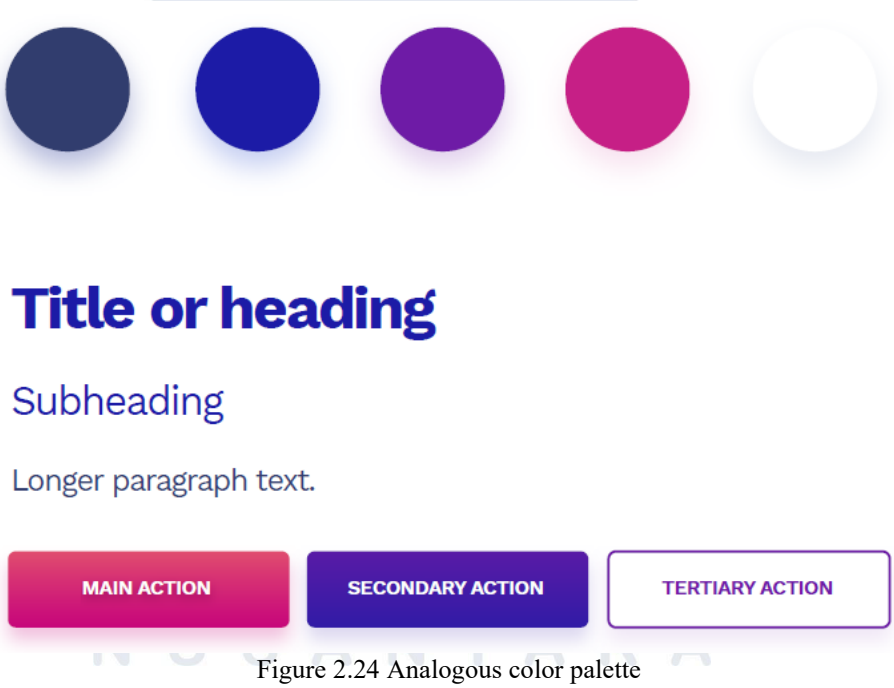

Figure 2.24 Analogous color palette
Source: Malewicz (2021)

In choosing a color palette, it is essential to balance the colors in the palette with the golden ratio of 60:30:10. For example, the primary color is best suited for backgrounds and low-priority elements, which takes about 60% of the space in the design. Afterwards, 30% is the supporting hue,

namely the secondary color, used for higher hierarchy objects for it to be sufficiently visible. Finally, the accent color used for highlighting the most important elements or CTA buttons are used 10% in the design. By having a balanced color palette, the user experience of the design is enhanced.

2. Gradient

A gradient is a transition between two or more colors. The colors used in the gradient can also have a transparency value. Gradients are commonly used in UI design due to its familiarity with the human eye Malewicz (2021: 127), In choosing gradients for UI design, it Is essential to utilize its ability to create depth, showing a more defined shape, and catching the users' eye, guiding them to certain parts of the interface.

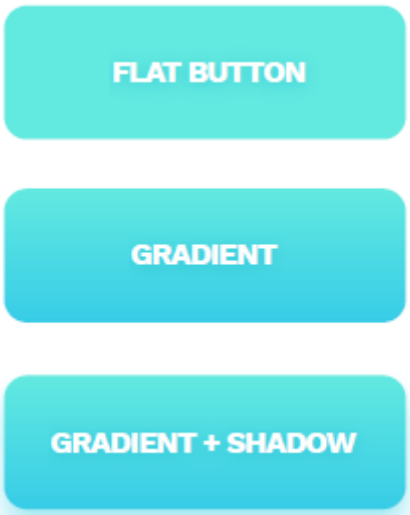

Figure 2.25 Usage of gradients in buttons
Source: Malewicz (2021)

By using gradients, buttons feel more clickable when compared to flat colors. Using gradients may be a good option to increase familiarity due to its realistic nature, but flat color can be used alongside gradients as it is better to use flat color to avoid clutter. By combining both the color styles, the design becomes more natural and user friendly.

Gradients have three main types as described in Malewicz (2021: 131). The types of gradients are linear, radial, and angular. Linear gradients

are the most common type of gradients used in UI design. It is a transition between two or more colors in a linear state, like top to bottom, left to right, or diagonal. A radial gradient starts with one color in the middle of the gradient ellipse, while the other ends up being on its edge. Its most common use is on a circular pattern, where the transition is evenly distributed along the circle. An angular gradient, on the other hand, goes around in a circle in an angle. The angle between the colors defines whether the transition goes both ways in a 180-degree angle or has one sharp dividing line in the middle at 0 degrees. Angular gradients are less recommended and rarely used in UI design.

Figure 2.26 Gradient colors
Source: Malewicz (2021)

In determining the colors for the gradient, it is recommended to choose a two-color gradient with similar and matching hues that have subtle differences between the colors (Malewicz, 2021: 134). Gradients are a common choice for buttons and other interactive elements. A gradient can be determined by first deciding on the two ends of the linear gradient, then reducing the hue of one end slightly. By doing that, the gradient will have similar colors with subtle differences between the two colors.

3. System states

In designing a user interface, a color palette must consider its system colors, the most common being positive, negative, neutral, or warning states of the interface (Malewicz, 2021: 124). In making a positive

system state, such as confirmation or success, it is recommended to use colors like green or blue which signify positivity or completion in UI design. In a negative state like an error or failure, red is recommended as it signifies errors an warnings in user interface design. For neutral states, the primary color of the app or shades of grey are recommended. Warning states, as they are less dangerous than error or negative states, are recommended with yellow or orange as they induce less visual strain than red.

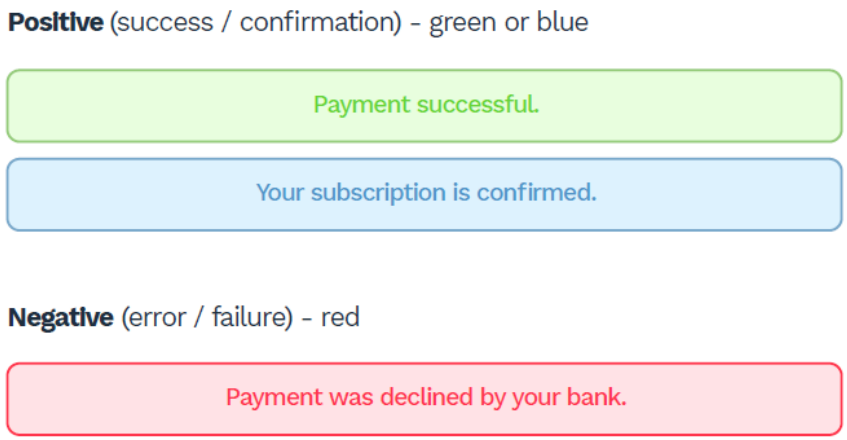

Figure 2.27 Positive and negative system states
Source: Malewicz (2021)

By using the colors that signify the meaning of the system states, users can relate more to the application system, applying the familiarity principle of user experience. Other applications of system states in color design for User Interfaces are the transparency. A lower transparency shows that the function is disabled, which prompts the user to not click on the element.

In the mobile application design for improving financial literacy among undergraduates through personal finance, the principles of hue, saturation, value, and color wheel is considered in deciding the color palette of the interface. The color palette consists of colors that relate with each other, which will result in a more fluid color scheme. Gradients and system colors will also be applied in the mobile application design in order to improve the user interface design, resulting in a better user experience.

2.4.2 Typography

Poulin (2012) stated that typography has two main functions, as a visual element in a design or as a visualization for verbal speech. A letter in typography has its own anatomy such as the arm, bowl, descender, leg, tail, and stroke. The anatomy of typography will be better illustrated in the image below.

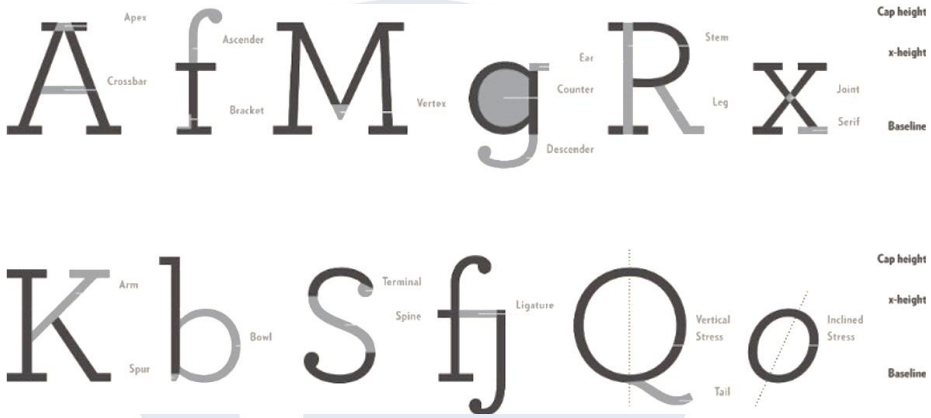

Figure 2.28 Anatomy of type
Source: Poulin (2012)

A typeface is a group of typography that have similarities in design. According to Poulin (2012), typefaces can be classified into 6 categories based on their styles, old serif, transitional serif, modern serif, sans serif, slab serif, and graphic.

1. Old Style Serif

   Usually, old style typefaces have less contrast between different thicknesses of stroke, an uneven thickness in diagonal strokes, terminals that are pear-shaped, and smaller counters for non-capital letters. Old style serif roots from the origins of roman writing. Examples of this kind of typeface are Garamond, Centaur, Berkeley Old Style, and Times New Roman. In mobile applications, this kind of typeface gives an ancient look, which is why it is used in medieval-themed game applications. However, as old style serifs are no longer part of the interface design trend, it is less commonly used in recent applications

   .

2. Transitional Serif

Transitional serifs are quite similar to old style serifs. However, unlike old style serifs, transitional serifs have a clear contrast between strokes. This kind of typeface has been used since the 1800s. Normally, transitional serif typefaces have sharp and bracketed serifs, vertical stress in the curves, and a longer x-axis. Examples of this typeface are Baskerville, Century, Perpetua, and Bell. Just like old style serifs, transitional serifs are also more likely to be applied in empire and medieval-themed games or applications, but rarely used in modern interface designs.

3. Modern Serif

Modern serif typeface was created and widely used in the late 1800s to early 1900s. This typeface has an even clearer contrast than old style or transitional serifs. Typefaces like Bodoni, Fenice, and Walbaum also have very thin serifs and brackets. The usage of modern serif in games signify a more royal and clean look compared to old style or transitional serifs. The contrast between the thin serifs and bold strokes show a more modern look, just like the name Modern Serif.

Figure 2.29 Modern Serif typeface
Source: https://uicreative.net/products/birgine-modern-serif-font

4. Sans Serif

Sans, in French, meaning "none" shows that this kind of typeface has no serifs. First popularized in the 19th century, sans serif has been used widely until the current era. Sans serif is a simpler form of typeface due to its similarities in stroke thickness and even vertical weight between letters. Examples of sans serif typefaces are Futura, Helvetica, Franklin Gothic, and Gill Sans. Sans serif fonts have various uses and are used in many modern interfaces. One of the most common advantages of using a sans serif typeface is the simplicity of the text to read. Modern mobile application interface designs tend to use this typeface due to its great readability and small visual stress for users who will read them

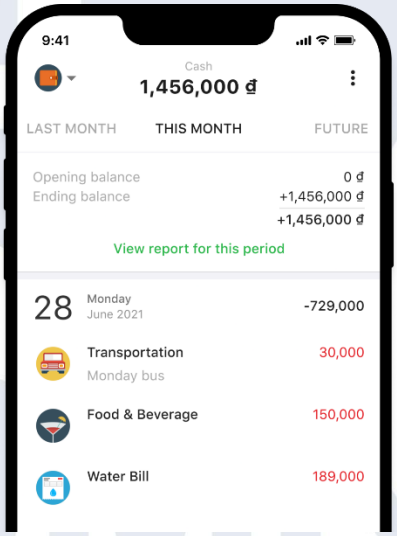

Figure 2.30 Sans serif used in Money Lover App
Source: https://moneylover.me/

5. Slab Serif

Typefaces with serifs that are equal in stroke weight and vertical stress are called slab serif typefaces. Slab serif typefaces usually have no bracketing, showing no contrast between strokes in the letters. Slab serif, just like sans serif, was also introduced in the 1900s. Examples of this kind of typeface are Rockwell, Silica, and Memphis. Slab serif typeface also has decent readability and is used in some interface designs as headers to attract attention.

Figure 2.31 Slab Serif typeface
Source: https://weandthecolor.com/silo-slab-font-family-typeunion/42201

6. Graphic

Finally, graphic typefaces include fonts that are mostly illustrative and share a common trait of attracting attention. Types of graphic fonts include blackletter, script, decorative, cursive, and brush. They are sometimes used for headlines in interface design. Examples of these fonts are Chiller, Brush Script, Harrington, and Mistral. This typeface is often used to express more meanings compared to serif or sans serif fonts. Using graphic typefaces in interface design comes with a risk of readability and visual stress, which is why the typeface is not recommended to be used excessively.

Figure 2.32 Decorative graphic typeface
Source: https://freeuiresources.com/gleamore-free-decorative...

In the mobile application design for improving financial literacy among undergraduates through personal finance, the writer applies the typography theories from Poulin (2012) in order to display the text and content of the application. By using different kinds and sizes of typefaces, the writer can create hierarchy and improve the user experience.

2.4.3 Illustration

Illustrations, or images are a medium for communicating emotion, seeking attention, expanding imaginations, and enhancing a visual narrative. Images are classified into four categories: volatile, fixed, still, and moving (Poulin, 2012). Firstly, an image is considered volatile or unstable when the image appears only for a brief moment. An example of this is an image from a mirror reflection. On the other hand, fixed images are stored and kept for a long time. Fixed images can come with or without a physical form (digital). Next, an image is considered as a still or static image if the image does not move. Still image examples are wallpapers and backgrounds, where they are images that have no movement. In contrast, moving images are a group of moving images, usually in the form of a video.

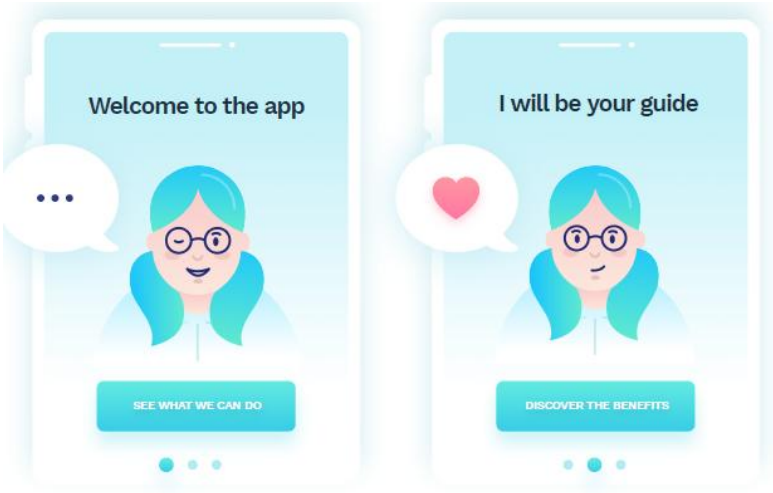

Figure 2.33 Illustration used in UI design
Source: Malewicz (2020)

Male (2017) stated that illustration is a functional form of art that communicates information through visual projections. He also added that illustrations have two forms of imagery: the first one being literal illustrations in which the image depicts reality, and the second one being conceptual illustrations that approach the image more metaphorically. Illustrations belonging to both forms can be applied to several practices. According to the book by Alan Male (2017), those practices of illustration are:

1. Information

   Illustration as an information medium is used to visualize and bring life to the content. This practice of illustration can be used as a means of education, reference, explanation, and instruction. Illustrated information are commonly more well-received by audiences as they can imagine and visualize the information better.

2. Commentary

   The practice of illustration as a means of commentary is commonly used in journalism. Commonly used to literate news and articles, commentary illustrations act as supporting media to help viewers understand the article better.

3. Narrative Fiction

In storytelling, especially in fiction, illustration is majorly used for imagining the situations, characters, or backgrounds of specific scenarios in a story. In a narrative, illustration is heavily influenced by the story genre. Illustrations catered towards younger audiences will commonly have more imaginative elements and have brighter colors, while illustrations targeted towards older audiences with a darker theme have a more serious look and darker colors. Illustrations in narrative fiction are commonly used in games, storybooks, novels, and comics.

4. Persuasion

Illustration as a means of persuasion is usually directed towards a certain goal. Persuasive illustrations are meaningful and are commonly associated with politics rather than simple promotion. Normally, the message delivered by this kind of illustration is direct. However, some persuasive illustrations also have hidden meanings, like caricatures as a means of political propaganda.

5. Identity

Illustration is used in building an identity for something. Visual identity is used by many things but is commonly used as a factor in a company's brand. Illustrations for showing identity have consistency and are supposed to be easily remembered. For example, a brand will have the same color and style for its logo, packaging, website, and other related products.

Illustrations are used in the mobile application design for improving financial literacy among undergraduates through personal finance to help with the storytelling of the application. The illustration used will enhance the user interface, creating more visual assets that are consistent according to UI principles. By using illustrations in the design, the message can be delivered in a clearer way not just by text, but also by other visual elements.

2.5 Financial Literacy

In his book "The Business School" (2003), Kiyosaki explained that financial literacy is the ability to comprehend topics related to financial problems. To add, Garman and Forgue (2010) stated that financial literacy is the knowledge regarding financial facts, such as the theories, concepts, and services that help be efficient in using money. These two theories show that financial literacy is a person's capability to understand financial topics with the comprehension of financial concepts, services, and facts. Basic knowledge that are included in the comprehension of financial literacy are personal finance, savings, credit, insurance, and investments (Rahayu and Meitriana, 2024). A person can be considered financially literate when they understand and apply the aforementioned components of financial knowledge in their daily life.

2.5.1 Personal Finance

Personal finance can be interpreted as someone's ability to manage their own finances, plan their financial plan, and face their personal financial problems properly. Ningrum (2021) stated that Personal Financial Planning is the ability to plan ahead in order to reach a certain financial goal while considering realistic economic assumptions like income, expense, inflation, and investment growth. A personal financial plan is made in order to take measures to achieve the financial goal within a certain period of time. With a personal financial plan, a person will be more prepared to face future financial challenges, as well as be wiser in differentiating which expenses are a need or a want. Marini, et al (2024) mentioned that good financial planning not only helps somebody balance between their expenses and future savings but also helps them to avoid being trapped in debt. This knowledge is essential in helping undergraduates to plan ahead financially, get prepared to face financial troubles, and not get ensnared in debt.

2.5.2 Savings

Saving up financially means a person spares certain amounts of wealth and allocates it for future use. Browning and Lusardi (1996) in Ling

(2021) stated that saving in an economic context is the amount of income saved up after expenses in a certain period of time. To add, (Ismail et al., 2020) mentioned that saving can also be interpreted as shaving off current expenses to increase future well-being. From the definitions, it can be understood that the practice of saving can help in future planning financially. By saving up, a person can get a clearer vision of their future and plan accordingly. Saving up also acts as a security net for difficult financial situations of a person. With saved-up wealth, a person will not easily fall into debt and rely on loans to resolve future financial problems.

2.5.3 Credit

According to the Indonesian Banking Law Number 10 Article 1 (1998), credit refers to the provision of money or equivalent receivables, based on an agreement for borrowing between a bank and another party. The debtor is obligated to repay the debt within a specified period, along with the interest charges that come with it. Lending a credit means the bank and the related party have trust in each other. The bank (creditor) trusts that the debt will be repaid, and the other party (debtor) trusts that the bank will provide the money or equivalent receivables for a certain period according to the agreement.

On the topic of Gen Z, The Chief Executive of Financial Services Business Conduct Supervision at the Financial Services Authority (OJK), Dr. Friderica Widyasari Dewi, mentioned that Gen Z and millennials are particularly vulnerable to getting entangled by online loans and illegal forms of credit. According to OJK, Gen Z and millennials aged 19-34 contribute around 37,13% to unpaid credit in online loans, most of any other age group. Unpaid credit is harmful to both parties, mainly ruining the debtors. The bank loses a certain amount of money, while the debtors may struggle to live financially and psychologically in the future due to getting banned from some other financial services and having debt collectors haunting them. This shows that in order to avoid those outcomes, these two generations need more

education regarding the credit system in order to not misuse them and fall into debt.

2.5.4 Insurance

Indonesian law of 1992 Number 2 defines insurance as an agreement between two or more parties (insurer and insured) in which the insurer commits to the insured party by accepting insurance premiums that may provide compensation for the insured party if the insured suffers losses, damages, or the loss of expected profits. Insurance covers the loss of various kinds of objects, such as items, health, life, and other important objects that may degrade or lose value. Having insurance in the things objects increases the preservation of the insured object and protects against unnecessary risks in the future. For example, if a person owns a car with insurance, and an unforeseen accident happens to it (e.g. crash), the insurance can help cover the repair costs, rather than normally paying for the replacement spare parts. Having insurance is part of having good financial literacy because insurance helps protect against unforeseen financial issues that may happen in the future.

2.5.5 Investment

Dwi (2023) mentioned that investment is a form of allocating a certain amount of resources, (money, effort, or time) in hopes of getting future gain/profit. Investment can be through many assets, but most people invest money in stocks, bond markets, real estate, foreign exchange, commodities, funding startups, etc. Investment is useful for a person to reach their financial goal. By planning ahead and assuming future profits through investment, a person can get long-term wealth and reach certain financial goals, like planning an early retirement.

2.6 Relevant Studies

To have a basis for the study and bring up novelty from the research, relevant studies must be researched and taken as a reference for creating a solution to the problem identified. Relevant past studies will be analyzed from their

backgrounds, methods, and results. These studies will be refered in more detail in the table below.

Table 2.1 Relevant Studies

No.	Research Title	Researcher	Results	Innovation
1	*Studi Literatur Pengaruh Penggunaan Gamifikasi dalam Pembelajaran Ilmu Komputer di Perguruan Tinggi*	Yulianti Anggraeni, Bambang Sujatmiko	The literature study of several journals and articles show that gamification helps in increasing the students' eagerness to learn.	The innovation of the literature study is the summary from various journals and articles that show the positive effects of gamification on learning.
2	*Penggunaan Aplikasi Pembelajaran Interaktif dalam Meningkatkan Keterampilan Dasar Siswa Sekolah Dasar di UPTD SD Negeri Dlambah Laok 2 Tanah Merah*	Ariep Mulyadi, Kusmiyati	The usage of interactive applications is proven effective in education for young students.	The innovation of the research is the usage of an application for educating Primary School Students as a new method of teaching.
3	*Pengaruh Tingkat Literasi Keuangan terhadap Personal Finance pada Mahasiswa Fakultas*	Elly Lestari, Yuni Setyawati,	General knowledge about financial literacy highly affects	The innovation of the research is finding the relation of a person's general

No.	Research Title	Researcher	Results	Innovation
	Ekonomi Universitas Tribhuwana Tunggadewi Malang	Simforianus Sarjo	personal finance.	knowledge in regard of their personal finance.

Through researching the relevant studies above, the writer gained several valuable insights. The insights learned from the relevant studies include the effectiveness of gamification in learning, mobile applications for education purposes, and the importance of general financial knowledge to personal financial planning. Thus, the writer's innovation to enhance financial literacy among undergraduate students is to make mobile application about personal finance education revolving around the interests of Generation Z, in both the design and narratives, along with adding gamification.