International Journal of Computing and Digital Systems
ISSN (2210-142X)
Int. J. Com. Dig. Sys. #, No.# (Mon-20..)

# Bridging Learning Gaps: Innovating Higher Education with Interactive Educational Podcasting Platforms

**Sarni Suhaila Rahim[1], Khairul Yasser Jusni[1], Che Ku Nuraini Che Ku Mohd[1], Shahril Parumo[1] and Suriati Khartini Jali[2]**

[1] *Fakulti Teknologi Maklumat Dan Komunikasi, Universiti Teknikal Malaysia Melaka (UTeM), 76100 Durian Tunggal, Melaka, Malaysia*
[2]*Faculty of Computer Science and Information Technology, Universiti Malaysia Sarawak (UNIMAS), 94300 Kota Samarahan, Sarawak, Malaysia*

*E-mail address: sarni@utem.edu.my, b032010076@student.utem.edu.my, cknuraini@utem.edu.my, shahrilparumo@utem.edu.my, jskhartini@unimas.my*

*Received ## Mon. 20##, Revised ## Mon. 20##, Accepted ## Mon. 20##, Published ## Mon. 20##*

**Abstract:** This article explores the process of creating interactive educational podcasting platforms for higher education students. These platforms aim to enhance learning experiences and bridge the gaps in education through the use of digital technology. The creation process involves three phases: analysis, design and development. In the analysis phase, the goals, target audiences, and learning outcomes are identified. Through thorough interview and consultations with the web developer experts, the specific requirements and preferences of the students are gained. This information is then used to inform the design and development process. The design phase focuses on creating intuitive and engaging learning environments. User interface and user experience considerations gathered from the experts during the analysis phase are used to achieve this. Elements such as multimedia integration, navigation menus, and interactive components are added to improve usability and promote active engagement. Accessibility features are also integrated to accommodate diverse learners and ensure inclusivity. The development phase involves implementing the functionalities required to support the features of the platform called KIKO, an interactive educational podcasting website designed to enhance higher education. The Software Development Life Cycle (SDLC) methodology is used to translate design specifications into functional prototypes. Iterative testing and refinement are carried out to ensure compatibility across devices and address any usability issues or technical glitches. Interactive educational podcasting platforms offer personalized, accessible, and engaging learning experiences that can revolutionize higher education. They make use of technology to bridge the gaps in education and foster collaboration. Continued research and collaboration will be essential in further optimizing these platforms and realizing their full potential in transforming higher education.

**Keywords:** Podcast, Web Development, User Interface Design, User Experience, Higher Education

## 1. INTRODUCTION

For several years now, podcasts have been a go-to source of entertainment for many people. Essentially, a podcast is an audio series that can be downloaded or streamed online. They're easily accessible from computers and mobile devices, so listeners can enjoy them while working or on-the-go. Some of the most popular podcast platforms include Spotify, Google Podcasts, and Apple Podcasts.

An educational podcast is a unique approach to teaching and learning that utilizes the auditory and visual senses. By combining the power of sound and images, podcasts provide an effective alternative to traditional learning methods. Multimedia elements such as graphics, text, video, and sounds can be seamlessly integrated into a podcast to enhance the learning experience, making it an ideal choice for those seeking a dynamic and engaging way to acquire knowledge.

The KIKO podcast is an educational website that curates a diverse range of topics that students are interested in learning about. With all the content conveniently located in one place, users can easily access and absorb basic concepts related to Interactive Media courses. Overall, the KIKO podcast serves as an invaluable resource for students seeking to enhance their

*E-mail:sarni@utem.edu.my, b032010076@student.utem.edu.my, cknuraini@utem.edu.my, shahrilparumo@utem.edu.my, jskhartini@unimas.my*

understanding of Interactive Media, particularly those currently pursuing studies in this field.

This article delves into the essential concept of crafting a user-friendly and captivating learning atmosphere for a podcast, with a strong emphasis on adhering to user interface (UI) and user experience (UX) design principles. The design elements, including multimedia integration, navigation menus, and interactive components, are meticulously integrated to encourage active participation and improve overall usability.

As interactive educational podcasting platforms continue to gain traction in higher education, they hold immense potential for bridging learning gaps and fostering collaboration among students and educators. By leveraging technology to create personalized, accessible, and engaging learning experiences, these platforms represent a promising avenue for innovation in the digital age. Through continued research and collaboration, the full potential of interactive educational podcasting platforms can be realized, ultimately transforming the landscape of higher education for generations to come.

The genesis of these platforms lies in the recognition of a pressing need: to transcend the limitations of the traditional educational frameworks and harness the transformative potential of digital technology.

As we embark on this odyssey of innovation and exploration, it becomes clear that the potential of interactive educational podcasting platforms knows no bounds. They represent not merely a technological novelty but a harbinger of a new educational renaissance, where the boundaries between learner and educator blur, and the pursuit of knowledge becomes an immersive and collaborative endeavor.

## 2. LITERATURE REVIEW

In today's world, the technology required to produce and access voice media is widely available. From Google Podcast to Spotify and YouTube Music, there is no denying that voice media has become a crucial factor in shaping our leisure activities and entertainment preferences. The demand for voice media has skyrocketed, enabling people to listen and learn anytime, anywhere. This presents a valuable opportunity for students as audio and video content can cater to different learning styles, such as visual, kinaesthetic, reading, and auditory. As such, podcasts can serve as an educational tool.

Podcasting, as an educational tool, has garnered attention for its ability to deliver audio content that is accessible, portable, and engaging. The integration of interactivity within educational podcasts has been identified as a promising approach to enhance learning outcomes. Interactive educational podcasting platforms offer unique opportunities to address learning gaps and cater to diverse learner needs in higher education. By providing personalized learning experiences and adaptive feedback mechanisms, these platforms can support students in mastering challenging concepts and bridging knowledge disparities. Moreover, the flexibility of podcasting allows educators to create supplementary content tailored to specific learning objectives, thereby accommodating individual learning paces and preferences.

This literature review explores existing research and scholarship related to interactive educational podcasting platforms and their impact on bridging learning gaps in higher education. There have been several studies in the literature reporting on the development of educational podcasts [1-13]. The effectiveness of interactive elements in podcasts for promoting deeper engagement and knowledge retention among students have been investigated in [14-20]. The development of podcasting platforms specifically for higher education have been presented in [1,4,5,8,11,14,15,17,19].

Despite the potential benefits, the implementation of interactive educational podcasting platforms in higher education is not without challenges. The internet is often lacking in educational content, with many popular podcast websites focused primarily on entertainment. This presents a challenge for those seeking podcasts that offer informative and educational content. Unfortunately, the exposure to educational podcasts is limited, making it difficult for students to utilize them as a viable learning resource.

In summary, the literature reviewed suggests that interactive educational podcasting platforms hold promise for innovating higher education and bridging learning gaps among student students. By leveraging the inherent flexibility and accessibility of podcasting technology, educators can create engaging learning experiences that cater to diverse learner needs and promote active participation in the learning process. However, careful attention must be paid to pedagogical considerations and technical challenges to realize the full potential of interactive educational podcasting in higher education settings.

### *A. Google Podcasts*

Google Podcasts is a website that serves as a domain for podcasts, allowing podcast listening apps and other similar services to easily find and play podcasts. While it offers a great resource for students to access educational content, the limited options available can be a drawback. Additionally, the interface may not be very user-friendly for students. Figure 1 shows the depiction of Google Podcasts.

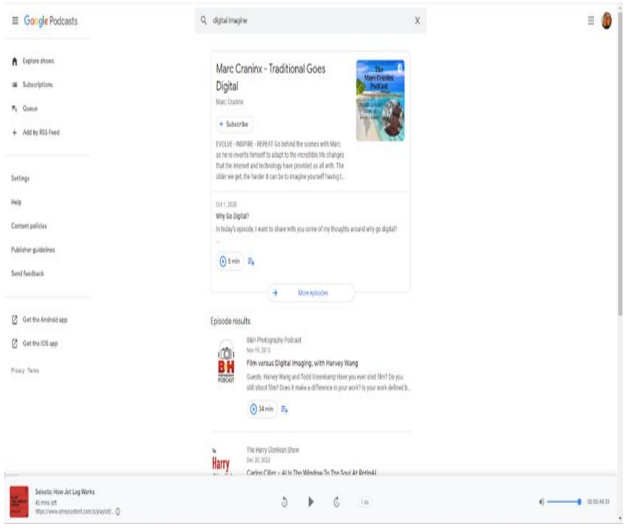



Figure 1. Interface for searching digital image in Google Podcasts

### B. *Spotify*

There are other platforms where students can listen to podcasts and music. A student can listen to content learning but is limited due to not having a lot of options and the interface is interactive use. Spotify is depicted in Figure 2 below.

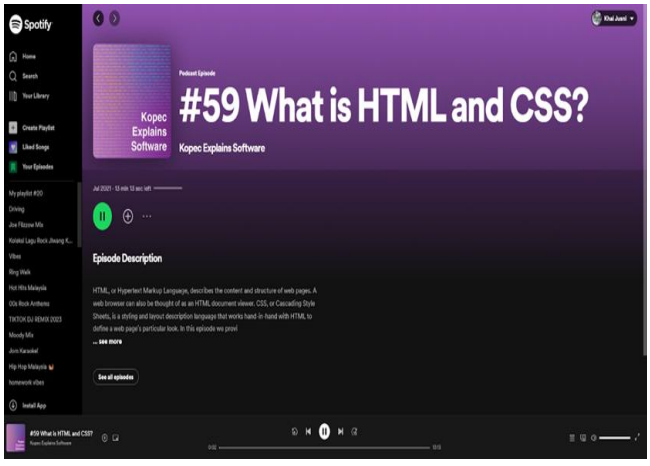



Figure 2. Interface for searching on What is HTML and CSS in Spotify

### C. *YouTube Music*

YouTube Music provides users with the ability to stream music and music videos. However, it is not the optimal platform for educational podcasts. Nonetheless, the platform boasts a distinct interface that includes a useful feature: video-to-audio and audio-to-video conversion. This feature is particularly beneficial for students who prefer to watch video podcasts. Figure 3 shows the interface of YouTube Music.

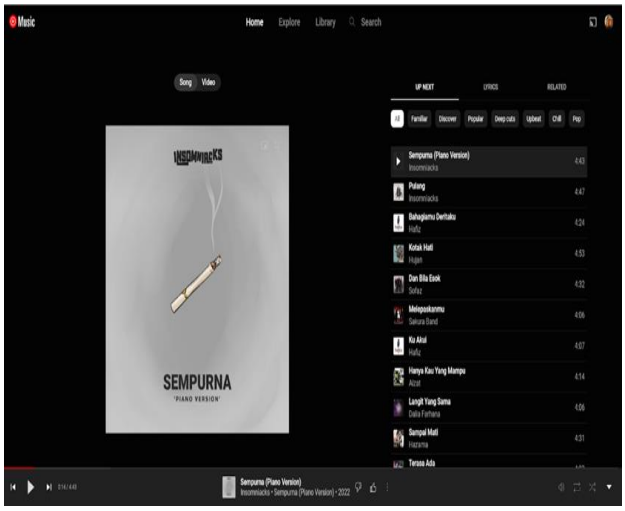



Figure 3. Interface for listening audio in YouTube Music

## 3. METHODOLOGY

The Iterative Model of the Software Development Life Cycle (SDLC) is the chosen project methodology for this initiative. It supports the fundamental development process by starting with a listing of requirements and then moving on to the creation of a simple design, followed by software implementation. As the project progresses and requirements are identified, updates and additions will be made to the system to meet them. All phases will be repeated until the project is completed successfully.

For the software requirements, several software are involved. Figma is used as an essential design software that facilitates creating low and high-fidelity prototypes for product development. Meanwhile, Visual Studio Code is a robust developer tool that serves as a cross-platform editor to build websites using HTML, CSS, JavaScript, and PHP. WampServer is a reliable web server platform that assists in interpreting the code generated in Visual Studio Code. PhpMyAdmin is used as an indispensable administration tool for managing website development databases.

This methodology sets the stage for examining the analysis, design, and development processes involved in creating interactive educational podcasting platforms aimed at innovating higher education. These platforms represent a fusion of audio-based content delivery and interactive features, tailored to meet the diverse needs and learning styles of higher education students. Through a comprehensive analysis of educational objectives, target audience preferences, and curriculum requirements, educators gain valuable insights into the specific design and development considerations necessary to create effective learning experiences.

The design phase of interactive educational podcasting platforms focuses on user interface (UI) and user

experience (UX) design principles, aimed at creating intuitive and engaging learning environments. Design elements such as navigation menus, multimedia integration, and interactive components are strategically implemented to enhance usability and promote active engagement. Additionally, accessibility features are prioritized to ensure inclusivity and accommodate diverse learners.

In the development phase, technical infrastructure and functionalities are implemented to support the interactive features of the platform. Employing methodologies such as the Software Development Life Cycle (SDLC), developers collaborate with instructional designers and subject matter experts to translate design specifications into functional prototypes. Through iterative testing and refinement, compatibility across devices and usability issues are addressed, ensuring a seamless user experience.

### A. Analysis

One of the most critical steps in organizing and providing data is to gather requirements. This can be achieved through two methods: qualitative and quantitative. Typically, interviews are used to make qualitative judgments. In this case, the interviewers were a back-end developer, and a System Analyst Programmer from First Pavillion Technology in Kuala Lumpur, Malaysia. Throughout the requirements gathering process, all project functions, anticipated interactions, as well as raw data and resource analysis will be considered. The development methods specific to this work will also be examined.

This research work aims to produce an educational podcast catering to students enrolled in Interactive Media courses. The user interface design of this work is anchored on the expertise of building Web Applications. To ensure that all requirements are met, a thorough analysis process must be conducted. In this particular work, the researcher had the opportunity to interview an expert in web development, whose details are listed in the Table 1 below.

TABLE I. CONTENT VERIFICATION

| Component | Details |
|---|---|
| Respondent | Respondent1<br>Respondent 2 |
| Company Name | First Pavillion Technology |
| Position | Back-end Developer<br>System Analyst Programmer |

### B. Design

The design process involves several phases, including defining learning objectives, assessing progress, preparing materials, and conducting tests. As the process unfolds, the designer will make progress and refine their skills. The end result will be a concept, layout, and design that provides both the designer and viewer with a clear sense of the project's interface. A storyboard design is a collection of illustrations or images that depict the sequence of a website's layout. This particular system includes several modules for students to view and listen to episodes, view topics, and log in or out of the module. Figure 4 shows the storyboard design for KIKO.

To provide a clearer and simpler execution of the work, high-fidelity prototypes or mock-ups must be built using design prototyping tools such as Figma. Figure 5 shows the main interface for KIKO. Table 2 shows the interface design for each module, along with expert suggestions for the main interface, library, search, topic, episode, play, audio, and video modules.

### C. Implementation

This section will explain the implementation phase, which involves generating web development based on the design phase and intended output. This part elaborates the production of color elements, the production of text, production of graphic, production of video, production of audio, production of web development and lastly, configuration management production.

#### 1. Production of Color Elements

The chosen colors for this product are based on the common palettes used in the website template. The main background color for this website is Charleston Green (#282828). Meanwhile, the content is provided in Antique White (#FAEBD7), Deep Lemon (#F8C51A), Celadon Green (#248892), and Dark Charcoal (#32312F). The use of a dark theme color creates an inviting atmosphere for visitors to explore. The color theme is ideal for higher education students due to its minimalist, formal, and simple modern design aesthetics. Figure 6 shows the color palette used in KIKO.

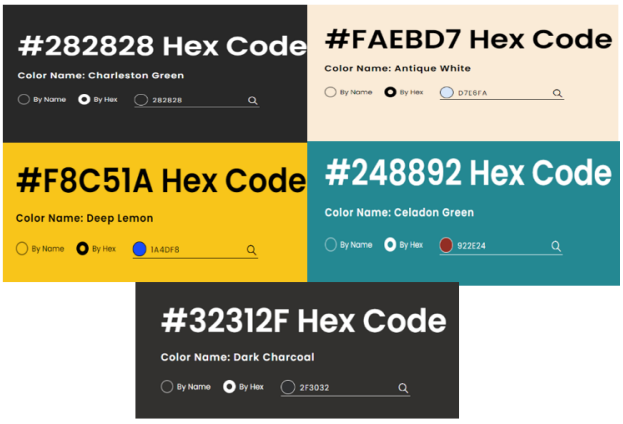



Figure 6. Color Palette Used in KIKO

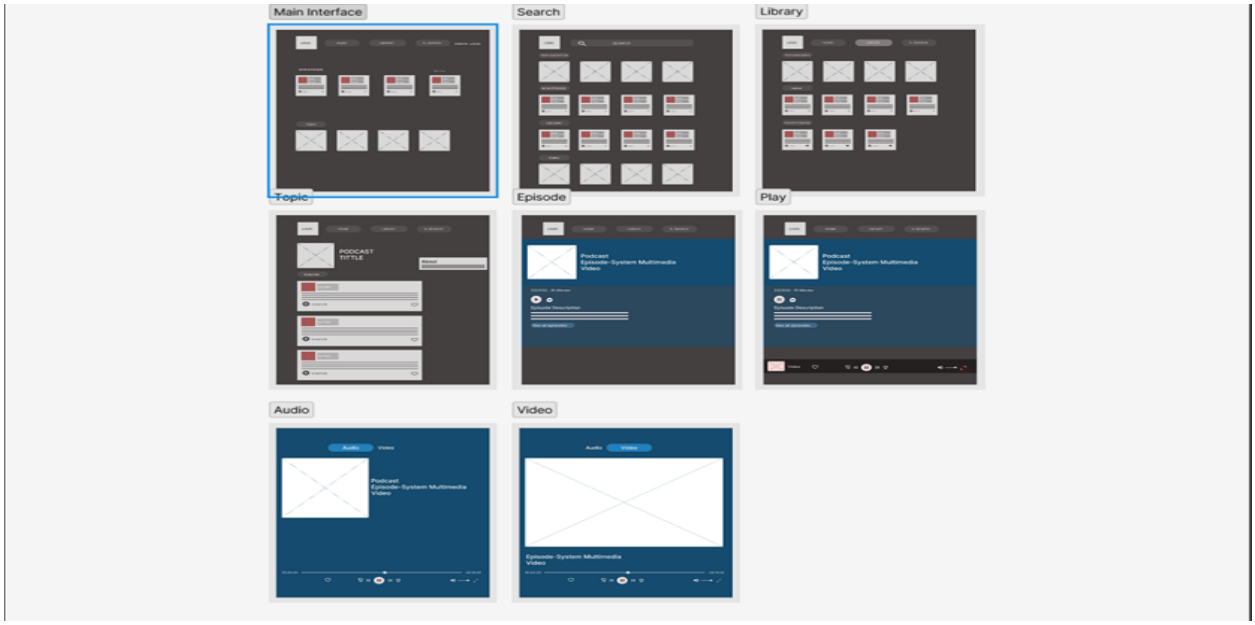



Figure 4. Storyboard design for KIKO

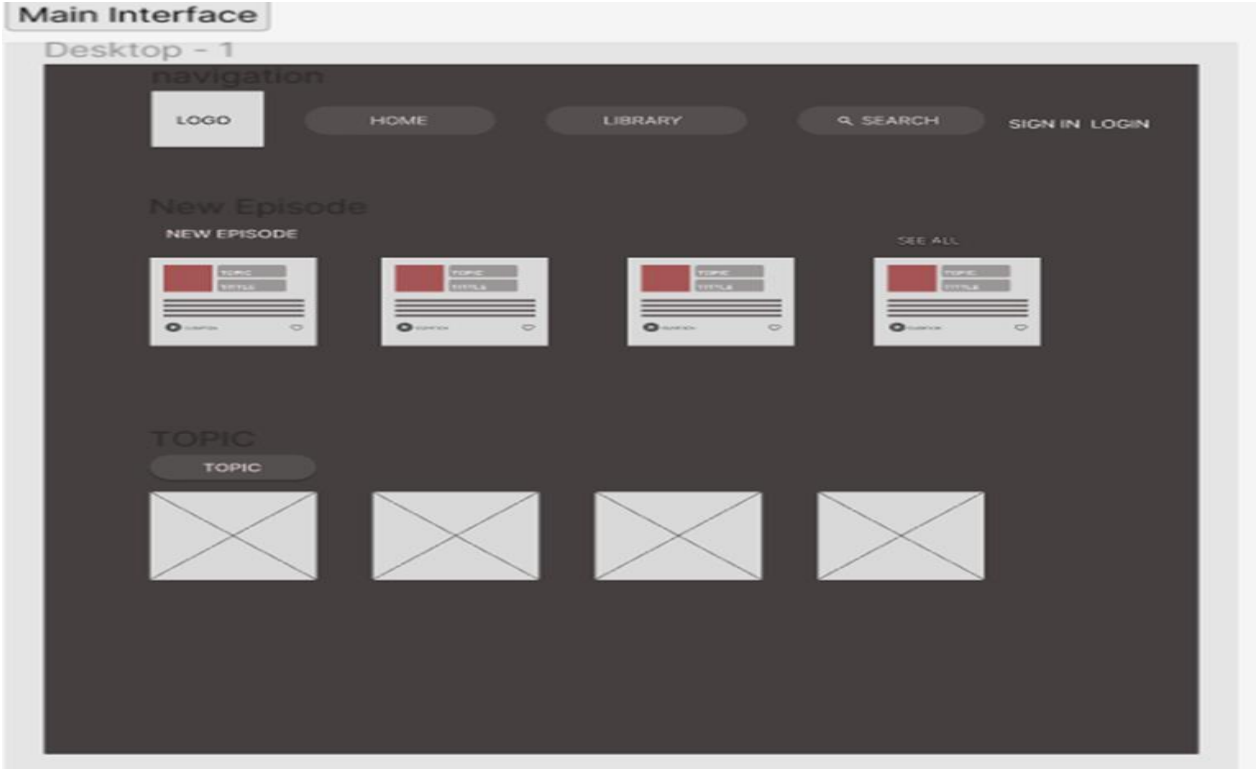
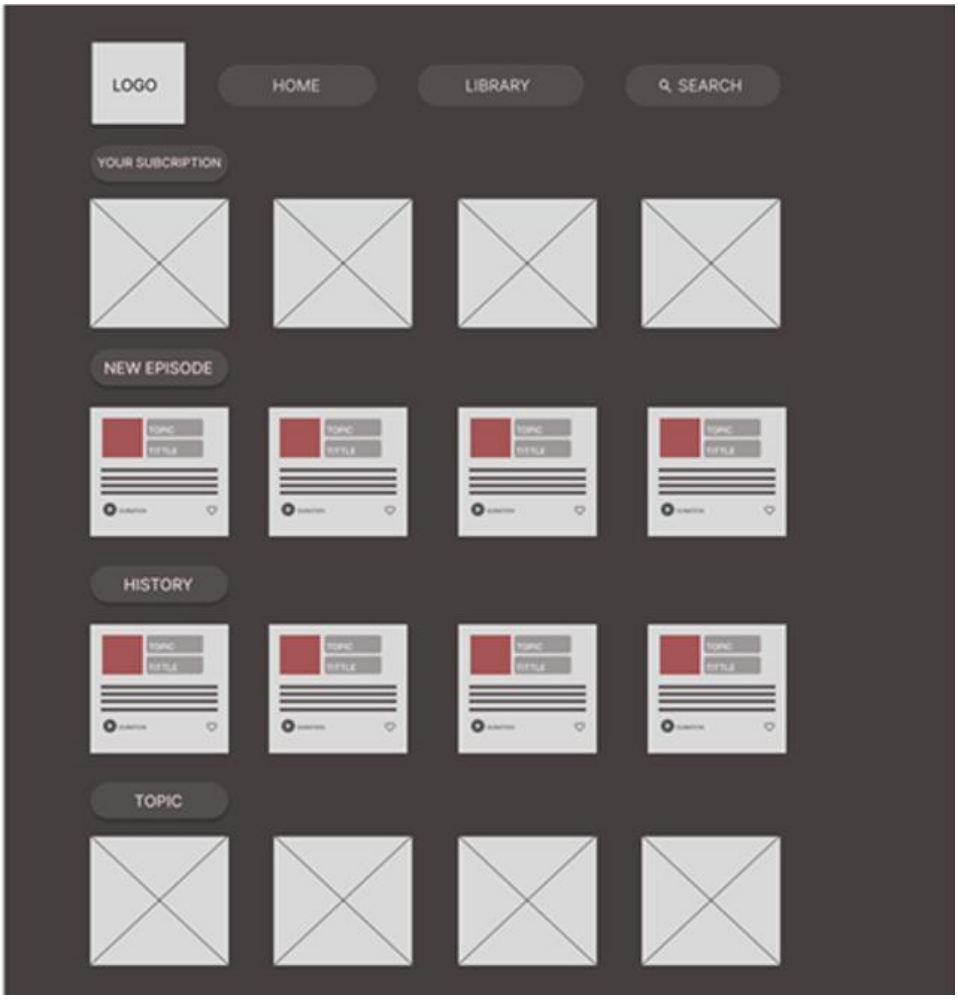
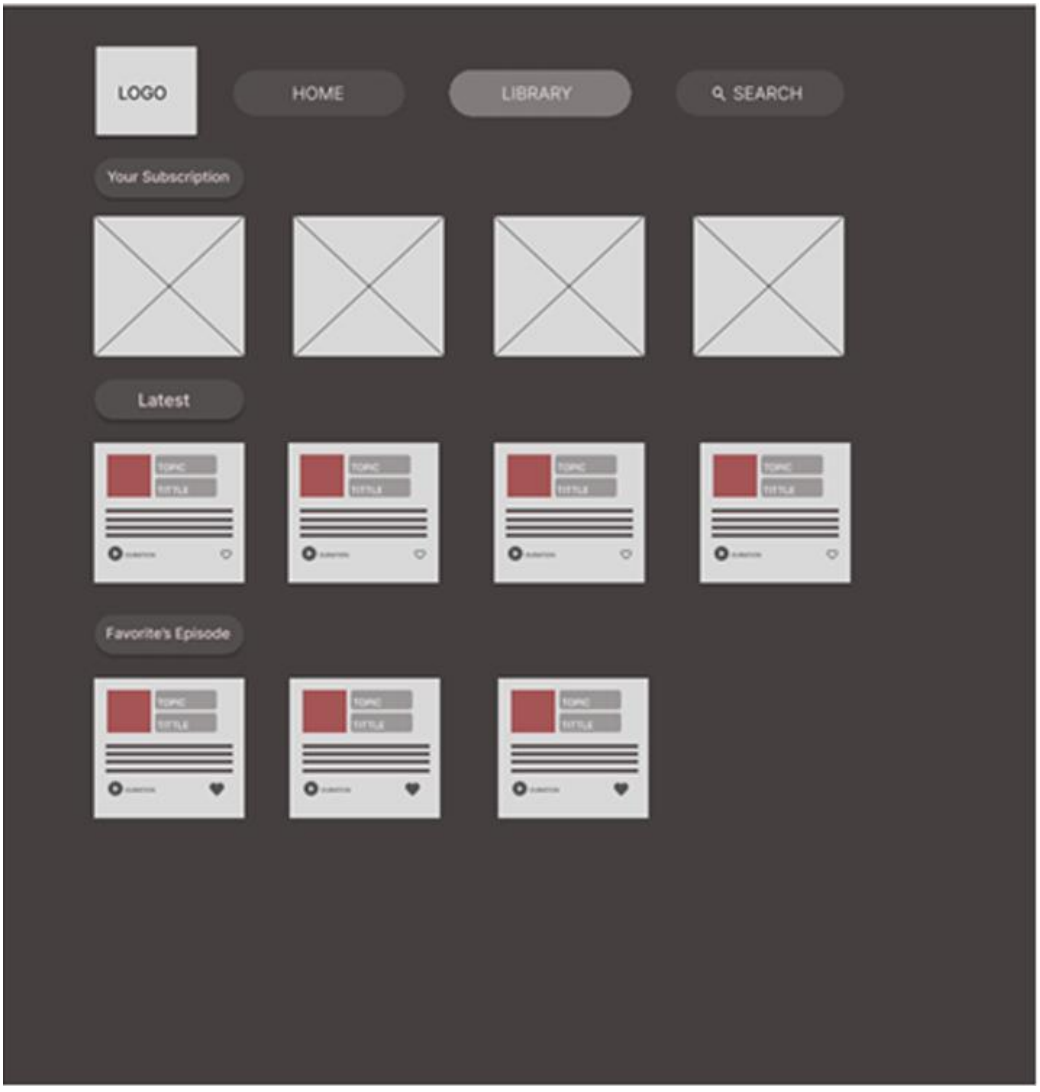
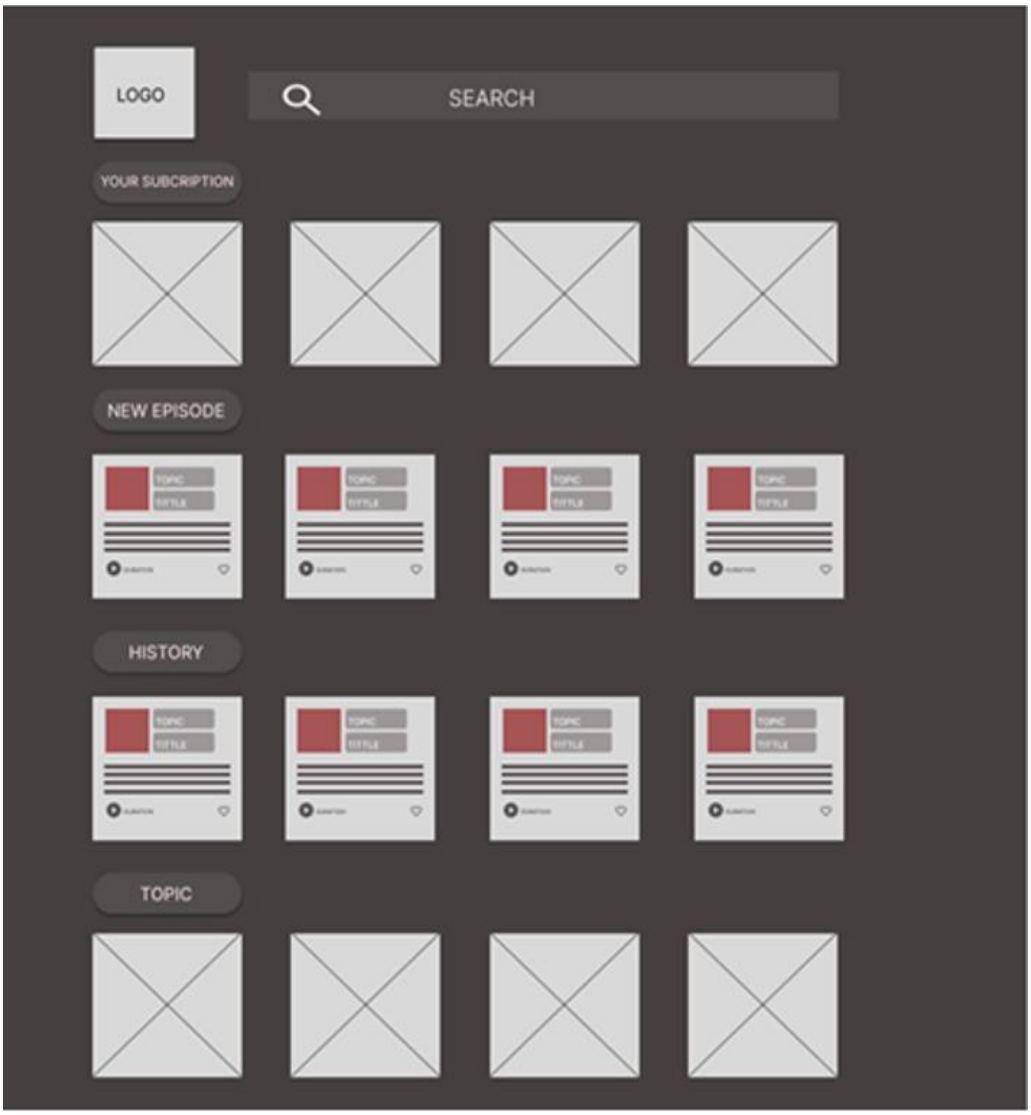



Figure 5. Main interface for KIKO

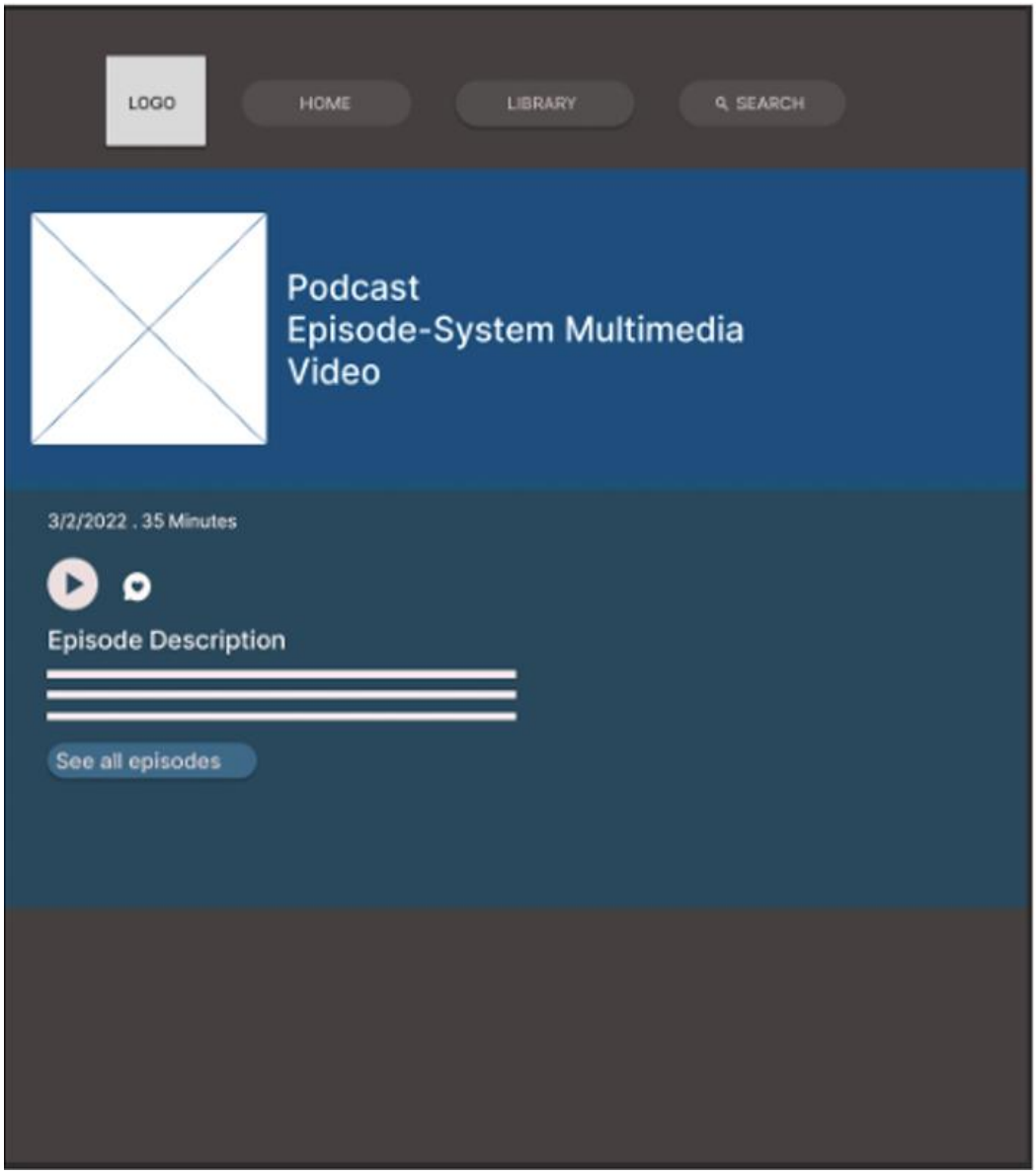
TABLE II. EXPERTS REVIEW

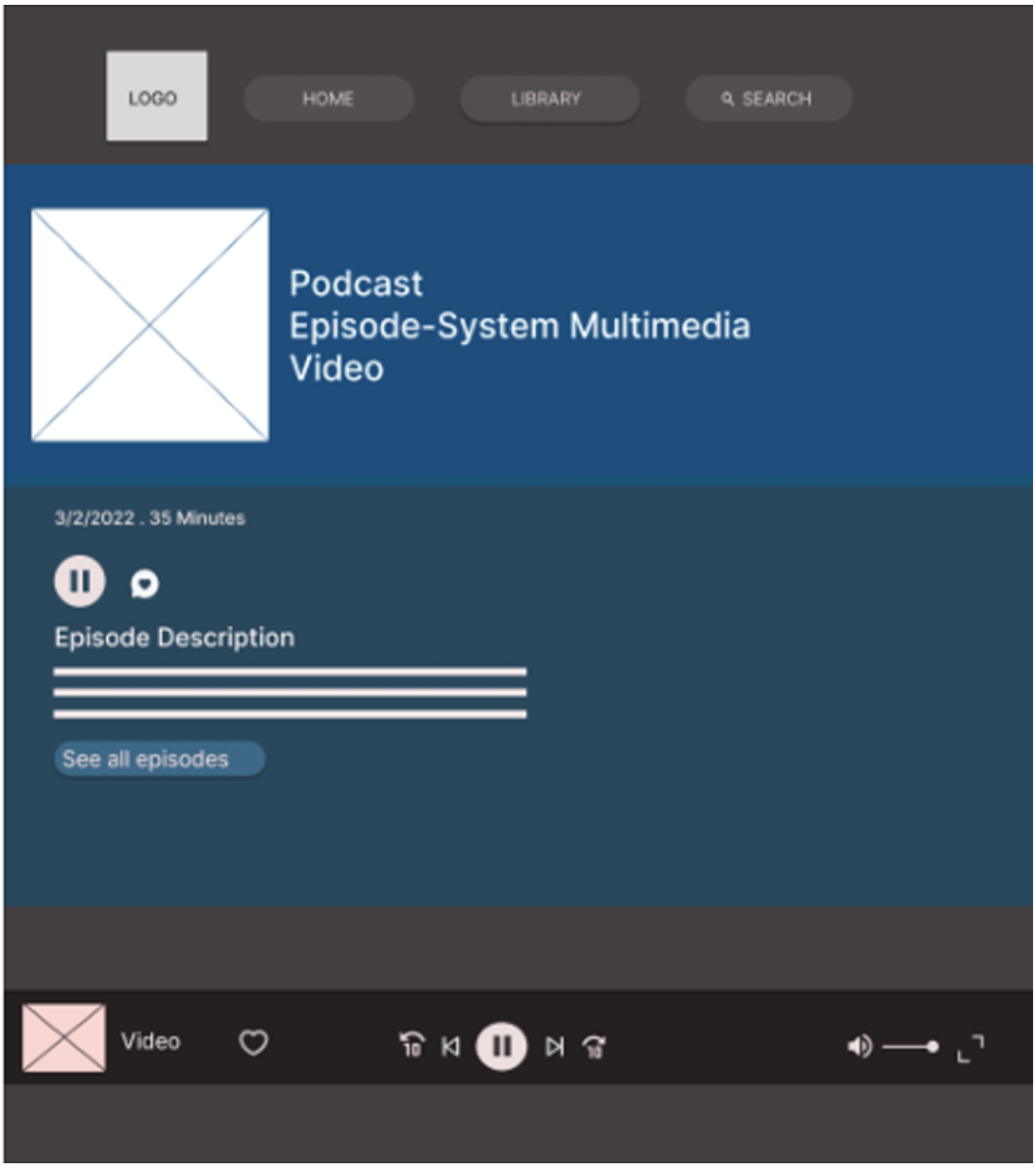
| Module | Content |
|---|---|
| Module 1: Main Interface |  |
| | **Comments from experts:**<br><br>1. Use active button for current pages activated by the user. Ensure the 'HOME' button is active to tell users which pages they are on.<br>2. The position of the Search Bar is more suitable to put in the header across most pages to every site location.<br>3. Instead of putting 'Your Subscription' as a button, change it to a heading tags indicator to tell user the UI component visualizes.<br>4. The category order would be nice if start with:<br>i. New episode/History<br>ii. History/New episode<br>iii. Your subscription<br>iv. Topic |

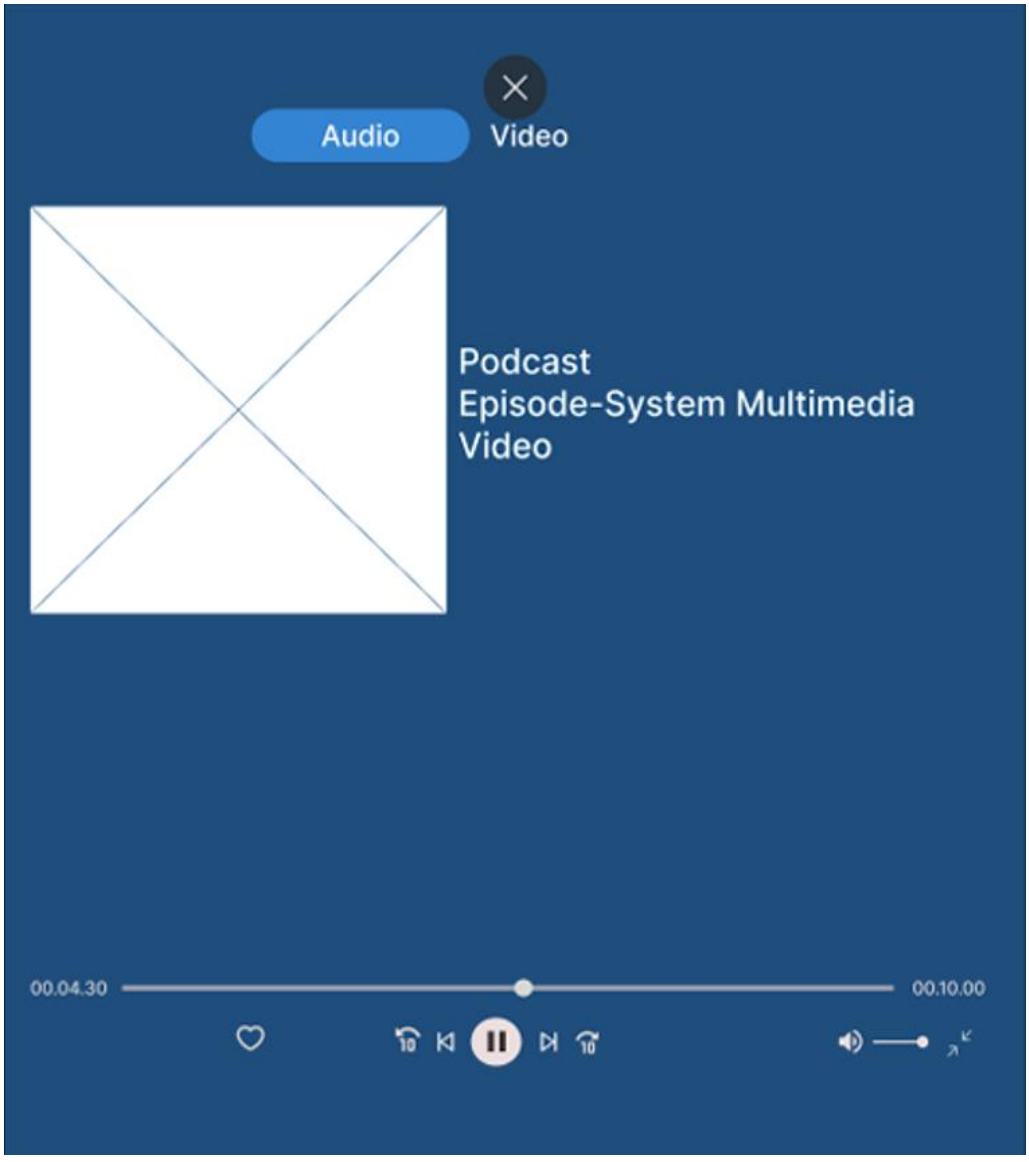
| Module | Content |
|---|---|
| Module 2: Library |  |
| | **Comments from experts:**<br><br>1. The consistency on each element title and content should not behave in the same way. Users might feel unfamiliar and confused with the page they are heading to.<br>2. Letter casing could affect the comprehension of the content, please capitalize every word to make the content more serious and professional. |

| Module | Content |
|---|---|
| Module 3: Search |  |
| | **Comments from experts:**<br><br>1. To have more emphasis on searching, make sure the border sizes are large and consistent with other pages and use the search bar at the top-right or top center of the web page. It would be nice to have suggestion keywords for search key or history of last 3 search key.<br>2. Padding between button title subscription and all any other elements need to have more space to breathe, including spaces between one division to another.<br>3. All pages need to have the same range of size when adjusting the look of an individual element. The space layout between the element needs to be logical to organize on the screen. |

| Module | Content |
|---|---|
| Module 4:<br>Topic |  |
| | **Comments from experts:**<br><br>1. It could be impressive to have a back/return button for the user to navigate to the previous page of the site. Breadcrumbs in UI can help users to know which pages they are on and could be going all the way back to the homepage.<br>2. The division between podcast title, 'About' and subscriptions are overlapped between each other and are not in the proper layout. This could make the developer feel hard to implement the code.<br>3. Consistency of the left and right padding on all the page is not consistent on every page. Please consider having a smaller layout for subscriptions and a suitable size for division between elements.<br>4. The icon of the play button, like button, and 'DURATION' texts are not aligned together.<br>5. Put released date for each episodes and sort by latest episode. |

| Module | Content |
|---|---|
| Module 5: Episode |  |
| | **Comments from experts:**<br><br>1. To add a UI timestamp on the page, please use Date and Time Stamp standards pattern rather than put '.', use something else to separate the date and time. Users might feel confused with the podcast range of time and the time at the moment.<br>2. The design of the page can refer to Spotify or YouTube Music. |

| Module | Content |
|---|---|
| Module 6: Play |  |
| | **Comments from experts:**<br><br>1. Same goes with Module 4 and 5.<br>2. Remove gap between podcast card and play toolbar. Make it sticky at the bottom.<br>3. Add queue list for users to add next podcast to watch. |

| Module | Content |
|---|---|
| Module 7: Audio |  |
| | **Comments from experts:**<br><br>1. The exit button is ok if the icon only appears when the user slides the page (do not make it a fixed icon).<br>2. The position of audio and video are not so centered. Maybe can make it center the page so that it will look more professional.<br>3. Can use toggle to change between the Audio and Video element instead of using a simple button.<br>4. Audio progress bar with time labels to indicate the time process must be in the duration format, such as HH:MM:SS. |

| Module | Content |
|---|---|
| Module 8: Video |  |
| | **Comments from experts:**<br><br>1. Same goes to Module 8.<br>2. Differentiate the progress bar with colors. |

*2. Production of Text*

This educational podcast website employs a family of font styles, including Franklin Gothic Medium, Arial Narrow, Arial, and sans-serif, as shown in Figure 7. These styles are available in a range of sizes, from regular to extra-large, to ensure optimal readability.


Figure 7. Font size and type used in KIKO

The layout and functionality of web content are carefully crafted to respond to user interactions. This is achieved through the use of various text-based resources such as HTML, CSS, Bootstrap, and JavaScript. Fonts are applied using both External and inline CSS, which are retrieved from the server by the browser. The behavior of text in web content is closely tied to its structure and appearance. For instance, when a user hovers over the "login" button in the KIKO Figure 8 below, the font color changes to indicate that the button has been activated.


Figure 8. Font color header KIKO change when hover

*3. Production of Graphic*

Graphics and images are integral to the editing and design process of this website. Adobe Illustrator was used to create the logo and cover topics in PNG and JPG formats. The logo features the onyx hue (#393737), while the cover topic was designed with the dark vanilla shade (#D1C99C) and flax tone (#e4d390), as shown in Figure 9.

*4. Production of Video*

The system generates videos based on the content details that have been input into its databases. Due to the limited size of MySQL, the video topic details are stored there while the actual video is saved in MP4 format on an external disk. To access the video, simply call the relevant detail using PHP language.


Figure 9. Illustration of the logo and topic

*5. Production of Audio*

The audio generated in this system is sourced entirely from the content details inputted into its databases. The audio information is stored within the databases, as MySQL has size limitations. The resulting audio files are saved on an external disk in MP3 format. To access the audio, simply call the relevant details using PHP.

*6. Production of Web Development*

To effectively integrate the database server, the web system utilizes PhpMyAdmin to manage the administration of both Apache and MySQL. The Entity Relationship Diagram (ERD) is a crucial tool for database design, providing a structural diagram that outlines the data types required to store and display information from the server on the website.

The server-side scripting language is used to create dynamic content and interact with databases to deploy course details, student information, and performance records in the table structure.

To create a visually appealing and engaging webpage, the design interface necessitates the use of programming languages such as HTML, CSS, and JavaScript via a code editor. These languages facilitate the incorporation of various elements such as links, text, images/videos, audio, and more, each of which is defined by specific tags within the code. Furthermore, these elements can be styled to enhance their interactivity and appeal to the user.

*7. Production Configuration Management*

The production configuration is accomplished through WampServer, which allows for local PHP script execution on Google Chrome via the localhost hyperlink. This deployment requires manual installation of a web server and PHP to enable website testing on a laptop.

To facilitate the viewing of dynamic PHP pages on Chrome, it is necessary to save the PHP script on the web server and configure the web address accordingly. Additionally, WampServer can be used to locally generate and preview these pages, with access to the PhpMyAdmin package for efficient database management and integration with PHP web pages.

## 4. DISCUSSSSION

The integration of interactive educational podcasting platforms into higher education represents a significant step towards addressing learning gaps and fostering innovation in teaching and learning. In this discussion, we delve into the analysis, design, and development aspects of these platforms and their implications for higher education.

Analysis is a crucial phase in the development of interactive educational podcasting platforms as it lays the foundation for understanding the needs and preferences of both students and educators. Through comprehensive needs assessments, stakeholder consultations, and curriculum alignment, educators can identify key learning objectives and target audience demographics. This analysis informs decisions regarding content selection, instructional strategies, and platform functionalities, ensuring that the resulting podcasts are relevant, engaging, and aligned with educational goals.

The design phase focuses on creating user-friendly interfaces and engaging user experiences that facilitate effective learning interactions. User interface (UI) and user experience (UX) design principles guide the development of intuitive navigation, multimedia integration, and interactive features such as quizzes, discussions, and simulations. These design elements are tailored to accommodate diverse learning styles and preferences, promoting active engagement and knowledge retention among students. Moreover, accessibility considerations are paramount during the design phase to ensure that the educational podcasts are inclusive and accessible to all learners. Designing with accessibility in mind involves providing alternative formats for content consumption, incorporating captioning and transcription features for audio content, and optimizing user interfaces for screen readers and assistive technologies. By prioritizing accessibility, educators can ensure that interactive educational podcasting platforms are accessible to students with disabilities and diverse learning needs.

The development phase involves the technical implementation of the design specifications and functionalities outlined during the analysis and design phases. Utilizing methodologies such as the Software Development Life Cycle (SDLC), developers collaborate with instructional designers and subject matter experts to translate design concepts into functional prototypes. Iterative testing and refinement are integral to this phase, allowing for the identification and resolution of technical issues, compatibility concerns, and usability challenges.

Through the analysis, design, and development of interactive educational podcasting platforms, higher education institutions can bridge learning gaps and foster innovation in teaching and learning. By providing personalized, accessible, and engaging learning experiences, these platforms have the potential to enhance student engagement, academic performance, and overall satisfaction. Continued research, collaboration, and investment in the development of these platforms will be essential to realize their full potential and transform the landscape of higher education.

## 5. CONCLUSION

The KIKO Podcast offers a valuable resource for higher education students seeking to learn about interactive media. With a user-friendly website and engaging concept, students can benefit from a range of topics and improve their understanding of their desired subject matter. The KIKO Podcast serves as a reliable one-stop-shop for gaining new knowledge and exploring new opportunities. We hope that this platform will inspire students to delve deeper into their studies and expand their horizons.

The analysis, design, and development of interactive educational podcasting platforms offer a promising avenue for bridging learning gaps and fostering innovation in higher education. By providing personalized, accessible, and engaging learning experiences, these platforms have the potential to enhance student engagement, academic performance, and overall satisfaction.

In the wake of our exploration into the intricate process of creating interactive educational podcasting platforms, it becomes abundantly clear that we stand at the precipice of a transformative era in higher education. These platforms, born from a convergence of technological innovation and pedagogical insight, hold the promise of revolutionizing the way we learn, teach, and collaborate.

Through the meticulous orchestration of analysis, design, and development phases, we have witnessed the birth of platforms that transcend the confines of traditional educational paradigms. Rooted in a commitment to enhancing learning experiences and fostering inclusivity, these platforms serve as catalysts for change, bridging the gaps in education and nurturing a culture of exploration and discovery.

As we reflect on the journey thus far, it is evident that the potential of interactive educational podcasting platforms knows no bounds. They empower learners to chart their own educational pathways, offering personalized, accessible, and engaging experiences that

resonate with the digital-native generation. Moreover, by fostering collaboration and inclusivity, they pave the way for a more equitable and interconnected educational landscape. Yet, the journey does not end here. As we look to the future, it is imperative that we continue to push the boundaries of innovation and exploration, harnessing the transformative power of technology to unlock new frontiers in education. Continued research, collaboration, and iteration will be indispensable in realizing the full potential of these platforms and charting a course towards a future where education knows no bounds.

In closing, let us embrace the promise of interactive educational podcasting platforms as harbingers of a new educational renaissance. Let us seize the opportunity to reimagine education, to challenge the status quo, and to forge a path towards a brighter and more equitable future for all. Together, let us embark on this journey of discovery, armed with the knowledge that in the pursuit of education lies the key to unlocking the boundless potential of the human mind.

In conclusion, interactive educational podcasting platforms have the potential to revolutionize higher education by providing personalized, accessible, and engaging learning experiences. These platforms can help bridge the gaps in education and foster collaboration among students. The creation process of these platforms involves careful analysis, design, and development to achieve the desired outcomes. As technology continues to evolve, continued research and collaboration will be essential in further optimizing these platforms and realizing their full potential in transforming higher education.

## ACKNOWLEDGMENT

This research is part of Final Year Project in Information and Communication Technology, presently being carried out at the Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka (UTeM). We are thankful to UTeM and all respondents who took part in the final survey and testing phase, and we would like to express our thoughtful appreciation to them.

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