

IMPROVING INTERACTIVE MEDIA EDUCATION: INVESTIGATING THE CAPABILITIES OF EDUCATIONAL PODCASTING PLATFORMS FOR ENHANCED LEARNING

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ABSTRACT

This study examines the transformative potential of interactive educational podcasting platforms in higher education. These platforms employ digital technology to enhance learning experiences and address educational shortcomings. The study evaluates a specialized interactive educational podcasting platform designed to support higher education students by offering a variety of subjects and modules tailored for distinct disciplines in interactive media courses. An experiment involving 19 participants comprising subject matter experts, multimedia experts, and students was conducted to assess the platform's effectiveness as a learning tool. The results indicate a positive impact on student engagement and learning outcomes. Interactive educational podcasting platforms provide personalized, accessible, and engaging learning experiences, presenting a significant opportunity to revolutionize higher education. Future research and collaboration will be crucial for optimizing these platforms and maximizing their potential to transform educational practices.

Keywords: *Podcast, Web Development, Interactive Media, Teaching and Learning, Higher Education*

1. INTRODUCTION

In recent years, a considerable number of people have adopted podcasts as a regular source of pleasure. A podcast is a web-based audio program that may be streamed or downloaded. Customers may engage with material while working or traveling because they are readily available on PCs and mobile devices. Leading podcast platforms include Spotify, Google Podcasts, and Apple Podcasts, each offering a wide range of content and genres to suit diverse preferences. An educational podcast offers a distinctive approach to teaching and understanding via the use of audio and visual elements.

Podcasts provide a compelling alternative to traditional instructional methods by incorporating audio and visuals. Podcasts are an ideal choice for individuals who are interested in an interactive and engaging learning methodology, as the educational experience is significantly improved by the inclusion of multimedia elements such as text, image, video, and audio.

This paper aims to conduct a thorough assessment of the usability of a podcasting platform

tailored for educational use, emphasizing its efficacy in assisting educators and students in the creation, sharing, and access of audio content for learning. This evaluation will examine various usability factors, such as ease of use, flexibility, functionality, learnability, content and user interface, in order to determine the platform's potential impact on educational engagement and learning outcomes.

The platform, an educational website, curates a wide array of topics relevant to students' interests in Interactive Media. Consolidating content in a single, accessible location improves the accessibility and understanding of key themes related to Interactive Media courses. This podcast serves as an excellent resource for students aiming to improve their understanding of Interactive Media, particularly for those involved in related fields.

It becomes clear that interactive educational podcasting platforms have immense potential as we begin this voyage of exploration and innovation. Not only are these platforms technological innovations, but they also represent a new era in education, in which the line between educator and learner becomes more ambiguous. By

transforming the pursuit of knowledge into an immersive and collaborative experience, they establish the foundation for a new educational renaissance.

2. LITERATURE REVIEW

2.1 Current Works

Because of its accessibility, mobility, and interesting structure, podcasting is becoming known as a great teaching tool. Including interactivity into instructional podcasts has become a quite interesting approach to raise learning results. Interactive learning podcasting systems offer special chances to fill in knowledge gaps and satisfy various needs of students in higher education. These systems enable students to bridge knowledge gaps and understand difficult ideas by providing customized learning experiences and adaptive feedback systems. Furthermore, the adaptability of podcasting helps teachers to develop customized extra materials fit for particular learning goals, therefore allowing different learning speeds and preferences.

This literature review investigates the current state of research and scholarship regarding interactive educational podcasting platforms and their potential to address learning disparities in higher education. Various studies have examined the efficacy of interactive features in educational podcasts [15-21], while others have documented the development of these podcasts [1-14]. The prospective benefits of these elements in the educational context are the primary focus of these studies, which emphasize their ability to improve knowledge retention and enhance student engagement.

Despite the prospective advantages of interactive educational podcasting systems, they encounter numerous hurdles when integrated into higher education. The dearth of high-quality instructional information online poses a considerable challenge, as several prominent podcast sites emphasize enjoyment. For individuals who are seeking educational and informative podcasts, this constraint poses challenges. For this reason, students' capacity to utilize educational podcasts as a valuable learning resource is impeded by their limited exposure to such content.

In summary, the literature review suggests that interactive educational podcasting platforms have the potential to significantly impact higher education and effectively address student learning disparities. The flexibility and accessibility of podcasting technology can be leveraged by educators to create engaging and personalized learning experiences that cater to the diverse requirements of students and facilitate active

participation. In order to fully benefit from the benefits of interactive educational podcasting, it is essential to effectively address both technical obstacles and pedagogical considerations.

A discussion of the development of podcasting platforms that are specifically designed for higher education can be found in [22-30]. In educational environments, podcast media has demonstrated potential, particularly in disciplines such as English and postgraduate studies, as evidenced by prior research. Simultaneously, these studies are often limited and catered to specific curricula. This paper suggests to overcome these restrictions by creating a new podcasting platform especially for the Interactive Media program. Incorporating materials from a range of relevant disciplines, such multimedia systems, human-computer interaction, web application development, virtual reality, and digital imaging, this platform provides a complete resource for students in this field.

2.2 Interactive Media Educational Podcasting for Higher Academic Learning

Developed utilizing a variety of software tools, an interactive instructional podcasting platform for higher academic study Figma was adopted for designing both low and high-fidelity prototypes, important for product development. Visual Studio Code, a powerful cross-platform editor, was utilized to develop the website with HTML, CSS, JavaScript, and PHP. WampServer gave a consistent web server environment for running and interpreting Visual Studio Code's code. Additionally, PhpMyAdmin was employed as a critical tool for maintaining the databases related with website creation. Figures 1 through 11 demonstrate screenshots of the created Interactive Media Podcast platform.

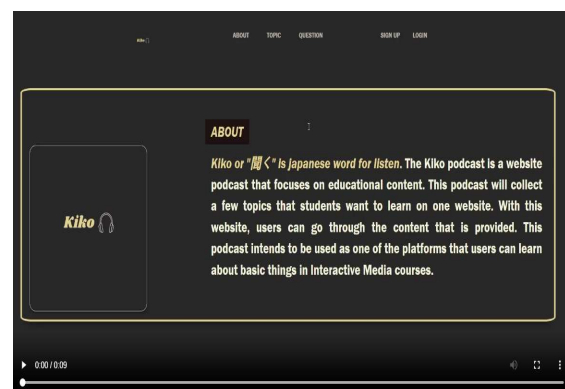


Figure 1: Screenshot of the main page



Figure 2: Screenshot of the Topic Selection page



Figure 3: Screenshot of the Latest Episode page

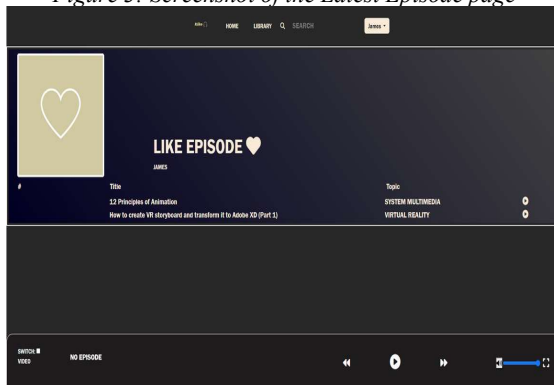


Figure 4: Screenshot of the Library page



Figure 5: Screenshot of the FAQ page



Figure 6: Screenshot of the Web Development page

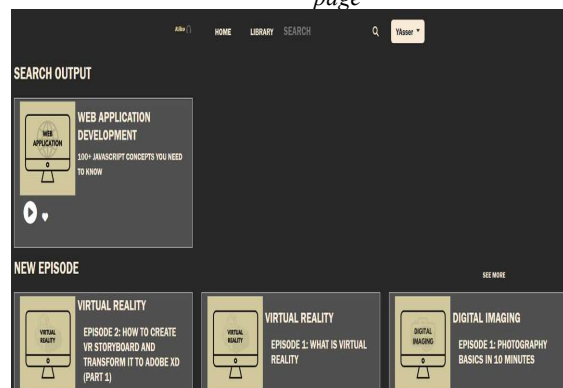


Figure 7: Screenshot of the Search Output page



Figure 8: Screenshot of the Topic page

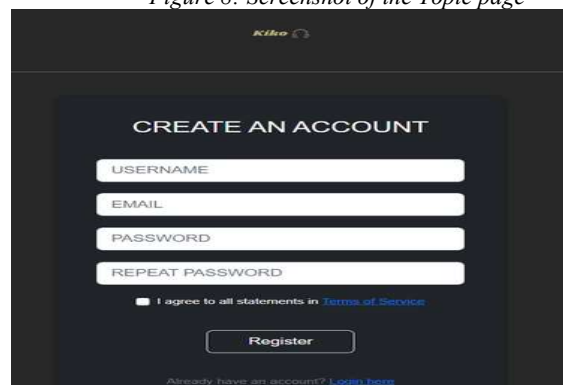


Figure 9: Screenshot of the Create an Account page

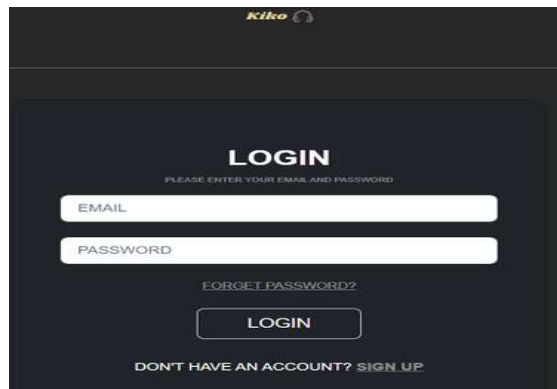


Figure 10: Screenshot of the Login page

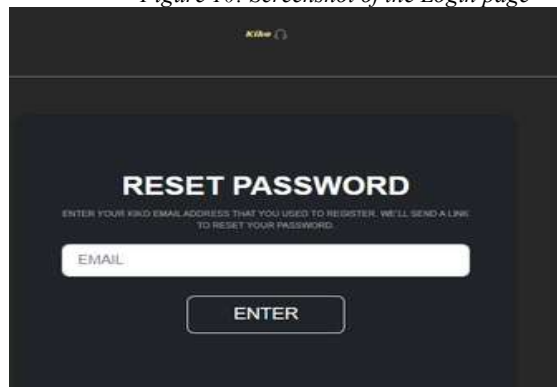


Figure 11: Screenshot of the Reset Password page

3. METHODOLOGY

This research employs the Iterative Model of the Software Development Life Cycle (SDLC) methodology. This architecture enables a flexible and progressive development process based on specific requirements. The first phase in this process is to identify the requirements, followed by the development of a preliminary design and the implementation of the program. The system is updated and refined to accommodate the changing requirements as development advances. This iterative process entails the repetition of all phases, including requirements gathering, design, and implementation, until the final product satisfies the established criteria.

The methodology section outlines the testing and results, which are critical components of the final phase of this work. The objective of the testing phase is to assess the effectiveness of the generated product in terms of the acceptability and interaction of end users. This section comprises a comprehensive test strategy that encompasses user profiles, test environment, test data, test results, and analysis. The goal is to ensure that the system functions as intended and meets user expectations.

The questionnaires were distributed to students and specialists in order to evaluate various aspects of the platform. The questionnaires evaluate critical factors, including adaptability, usability, user interface, content quality, and learnability. It is essential to integrate these components in order to acquire comprehensive feedback on the platform's performance and efficacy.

The evaluation's target users, scope, environments, and activities are delineated in the test plan. The primary focus is on students in higher education, specifically those who are enrolled in Bachelor of Computer Science programs with a concentration in Interactive Media. The testing was conducted in a hybrid format, which combined both online and in-person methods to effectively reach and evaluate the participants. The assessment process is divided into three categories: multimedia experts, subject matter experts, and students. Detailed information regarding the respondents is presented in Table 1. It is essential to approach each test with a methodical approach in order to attain its specific objective. Different types of tests will be administered to each category of testers. Participants will rate their responses on a scale of one to four, ranging from "strongly disagree" to "strongly agree," for all categories including subject matter experts, multimedia experts, and students.

Tables 2, 3, and 4 present the data collected from subject matter experts, multimedia experts, and students, respectively.

Table 2: Details of Subject Matter Expert

No.	Respondent	Position
1	Respondent 1	Backend Developer, First Pavillion Technology
2	Respondent 2	Software Engineer UI/UX, Razer Merchant Services
3	Respondent 3	Software Engineer UI Specialist, Razer Merchant Services

Table 3: Details of Multimedia Expert

No.	Respondent	Position
1	Respondent 1	Senior Executive Graphic Designer, GS Packaging Sdn Bhd
2	Respondent 2	Lecturer, Universiti Teknikal Malaysia Melaka
3	Respondent 3	Senior Lecturer, Universiti Teknikal Malaysia Melaka

Table 1: Testing Respondents

	Subject Matter Expert	Multimedia Expert	Students
Testing Instrument	Printed questionnaire	Printed questionnaire	Online questionnaire
General Information	Works in web development field	Works and experienced in multimedia field	Study at the higher education level
Total of Respondent	3	3	13

Table 4: Details of Student

Institution	Total	Age	Gender
Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka	13	18 -27 years old	Male (7) Female (6)

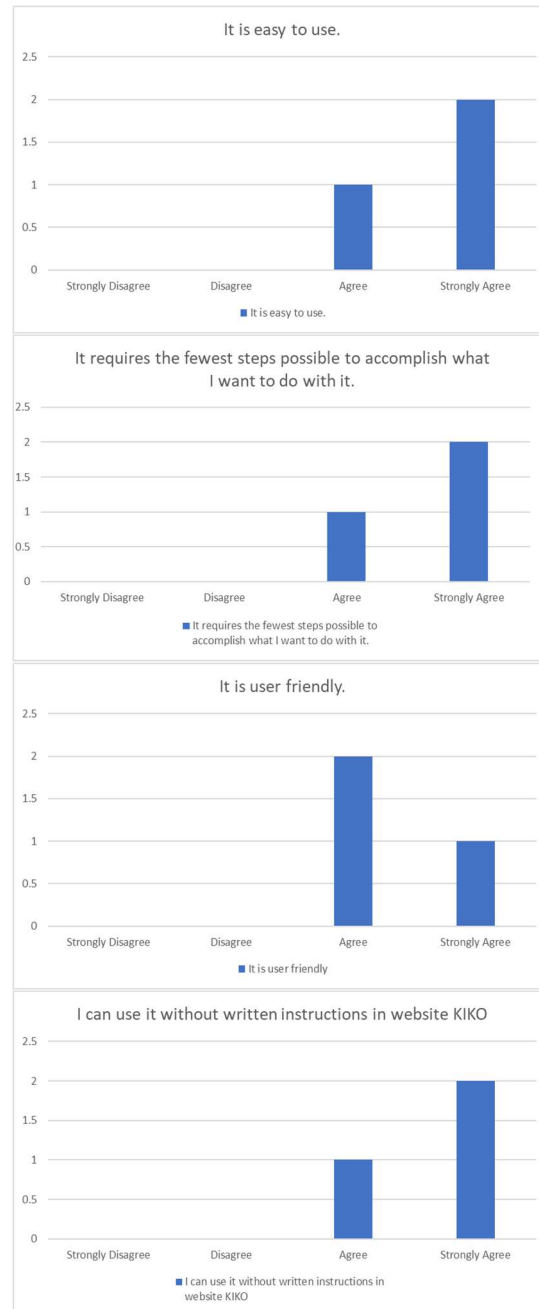
4. DATA ANALYSIS AND RESULTS

4.1 Subject Matter Experts

Three subject matter experts engaged in the evaluation during the testing phase. Each expert was requested to complete a questionnaire and evaluate the website from a web development standpoint after a demonstration. The gathered data was organized and illustrated in a bar chart for examination.

4.1.1 Chart of Ease of Use for Subject Matter Experts

The five sets of charts in Figure 12 illustrate the Subject Matter Experts' feedback on the system's ease of use. Across all five questions - ease of use, minimizing steps, user-friendliness, without written instructions and quickly recover from mistakes, the results show overwhelmingly positive responses. Each statement was met with either "Agree" or "Strongly Agree" from the vast majority of respondents. In particular, 67% of the participants "Strongly Agree" that the tool is user-friendly, minimizes the number of steps necessary to complete tasks, does not require written instructions, and is readily recoverable from errors. The remaining 33% of respondents "Agree" with these assertions. It is important to mention that none of the respondents expressed any disagreement, which suggests that the experts have a highly favorable opinion of the system's utility. This favorable feedback emphasizes the tool's efficacy and effectiveness in fulfilling user expectations.



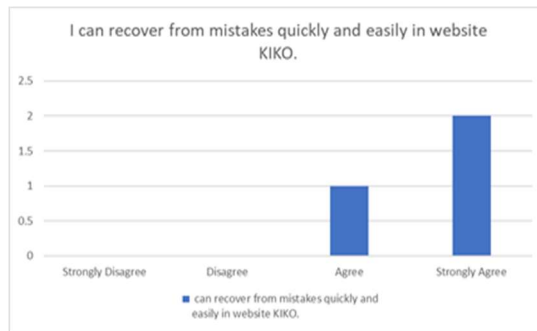


Figure 12: Results of Ease of Use by Subject Matter Experts

4.1.2 Chart of Usability for Subject Matter Experts

According to Question 1 in Figure 13, 67% of subject matter experts strongly agree and 33% agree that the system is simple for students to use. Question 2 reveals that 67% of experts agree and 33% strongly agree that the system is comfortable to use, attributing this to the well-designed modules that support long-term use by students. In response to Question 3, 67% of experts highly agree and 33% agree that the system is easy to learn and that students can explore and use it on their own. Question 4 shows that all subject matter experts agree that the system does everything that was expected of it and has all the features that students need to use it. Finally, Question 5 shows that 33% of experts agree and 67% strongly agree that they are overall happy with the platform.

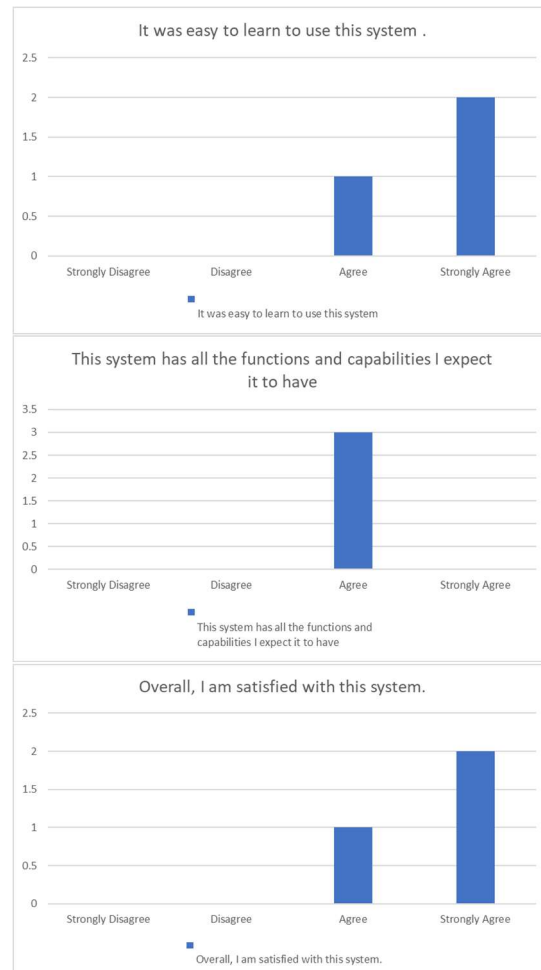
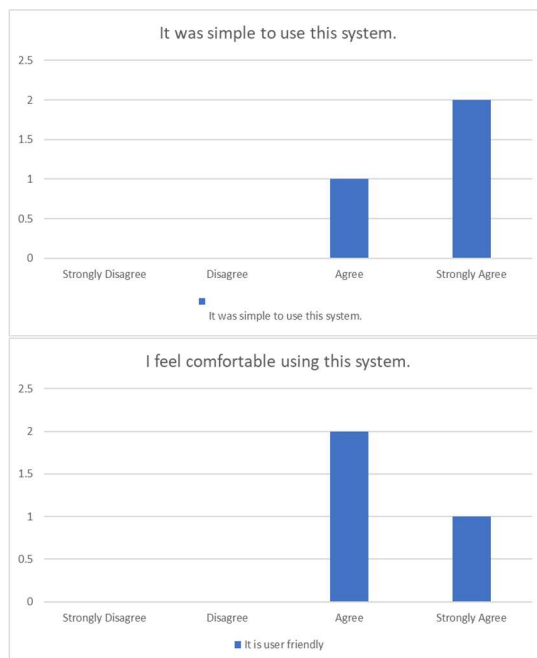


Figure 13: Results of Usability by Subject Matter Experts

4.1.3 Chart of Flexibility for Subject Matter Experts

The design for data entry is flexible, enabling students to easily construct a profile, according to 67% of subject matter experts who strongly agree with Question 1 in Figure 14. Conversely, 33% of expert respondents disagree. Question 2 indicates that 67% of respondents strongly concur and 33% disagree that the information in the system is comprehensive and presented effectively, with the use of colors and layout capturing students' attention. In accordance with Question 3, the content arrangement in the system is deemed adequate by 100% of subject matter experts. In response to Question 4, all respondents concur that the menu options are contextually appropriate for users. Lastly, Question 5 reveals that 67% of respondents firmly agree and 33% disagree that the display can be flexibly controlled by users, citing that the system is responsive to varying screen sizes.

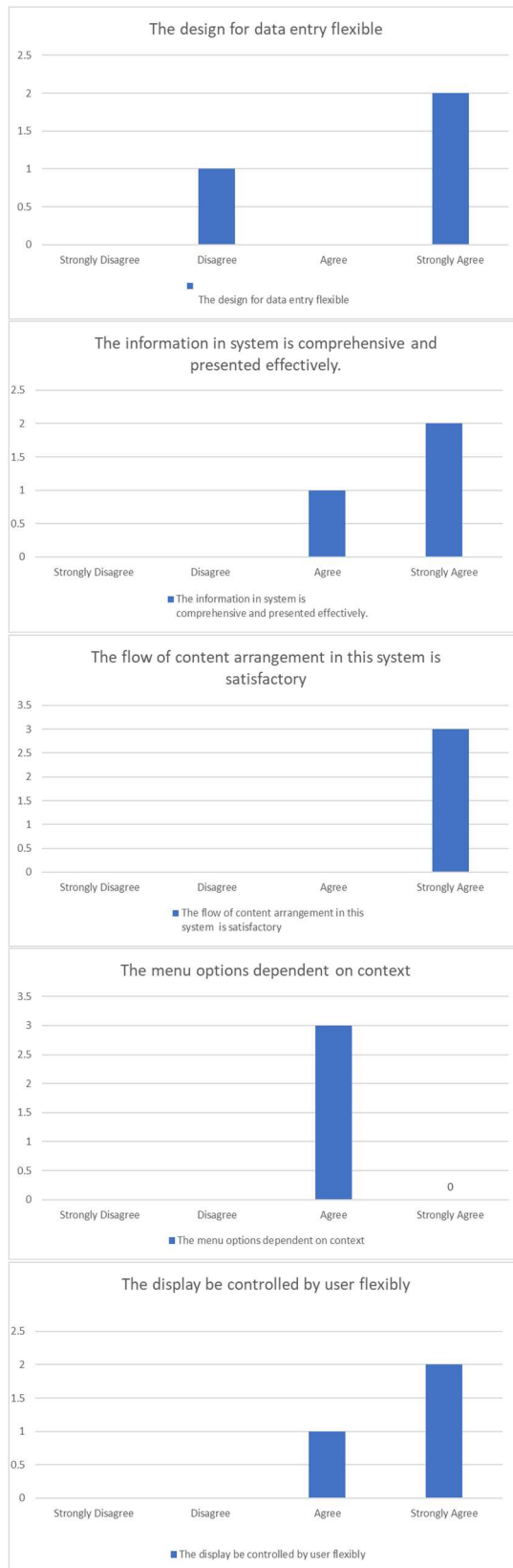


Figure 14: Results of Flexibility by Subject Matter Experts

Table 5: Result Summary for Subject Matter Expert

Question Type	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Ease of Use	0%	0%	40%	60%	100%
Usability	0%	0%	53.3%	46.67%	100%
Flexibility	0%	6.67%	13.3%	80%	100%

A summary of the responses from the Subject Matter Experts is presented in Table 5.

4.2 Students

The testing involved 13 university students enrolled in a Bachelor's degree program in Computer Science with a concentration in Interactive Media. Each student received a briefing on the questionnaire after a demonstration of the system. The gathered data were evaluated and depicted in charts to offer a concise summary of the findings.

4.2.1 Chart of Usability for Students

According to the results presented in Question 1 of Figure 15, 54% of the 13 students strongly concur that they feel at ease using the system, whilst 46% merely agree with this assertion. Question 2 indicates that 92% of the students strongly concur that the information supplied by the system is comprehensible, demonstrating the system's explicit aims. In response to Question 3, 77% of students strongly concur that the organization of information on the system's displays is obvious, signifying that the material is well-structured. Question 4 indicates that 69% of students strongly concur that the content is useful in facilitating task and scenario completion, since the system offers valuable insights and knowledge for assignments and projects. Ultimately, Question 5 indicates that 77% of students express high agreement regarding their satisfaction with the system's user-friendliness.

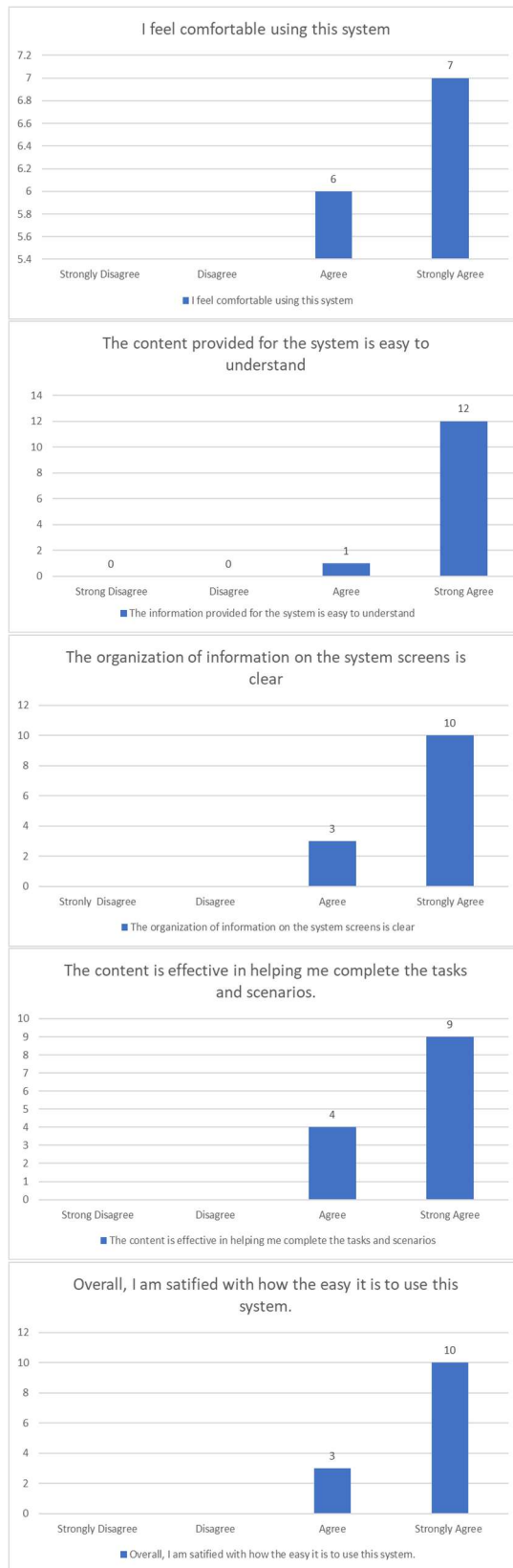
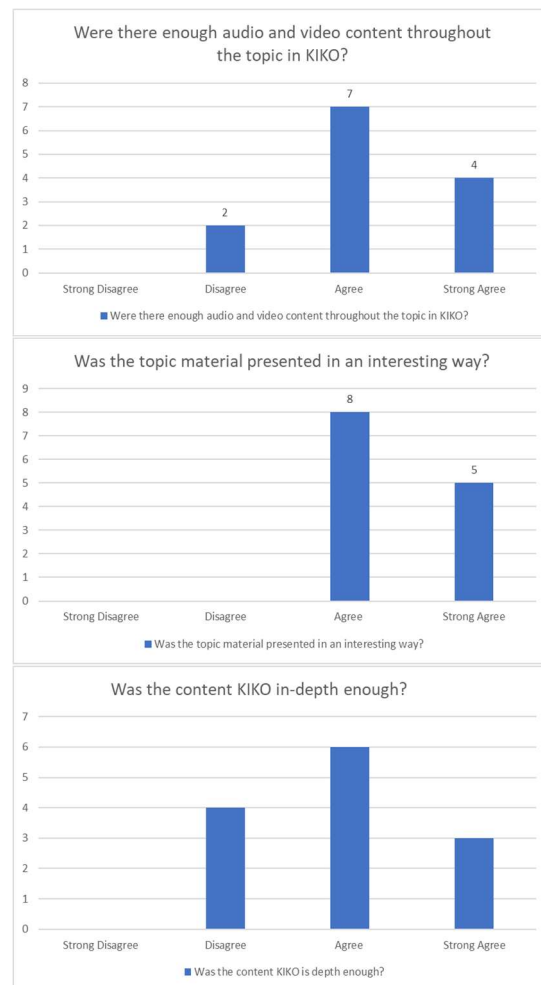


Figure 15: Results of Usability by Students

4.2.2 Chart of Content for Students

In Figure 16, according to the data from Question 1, 54% of the 13 students concur that there is adequate audio and visual content on each topic in the podcast. Question 2 indicates that 62% of students perceive the material as engaging, crediting the system's arrangement that divides each episode into discrete subjects, facilitating students' ability to locate and concentrate on the episodes they wish to study. In response to Question 3, 46% of students concur that the audio content is adequately informative, as the system delivers essential information on each subject. Question 4 indicates that 85% of students concur that the podcast subjects are easily identifiable, facilitated by distinct thumbnails for each topic, which aids students in swiftly recognizing their present learning material. Ultimately, Question 5 indicates that 77% of students strongly concur that the podcast subjects are comprehensible.



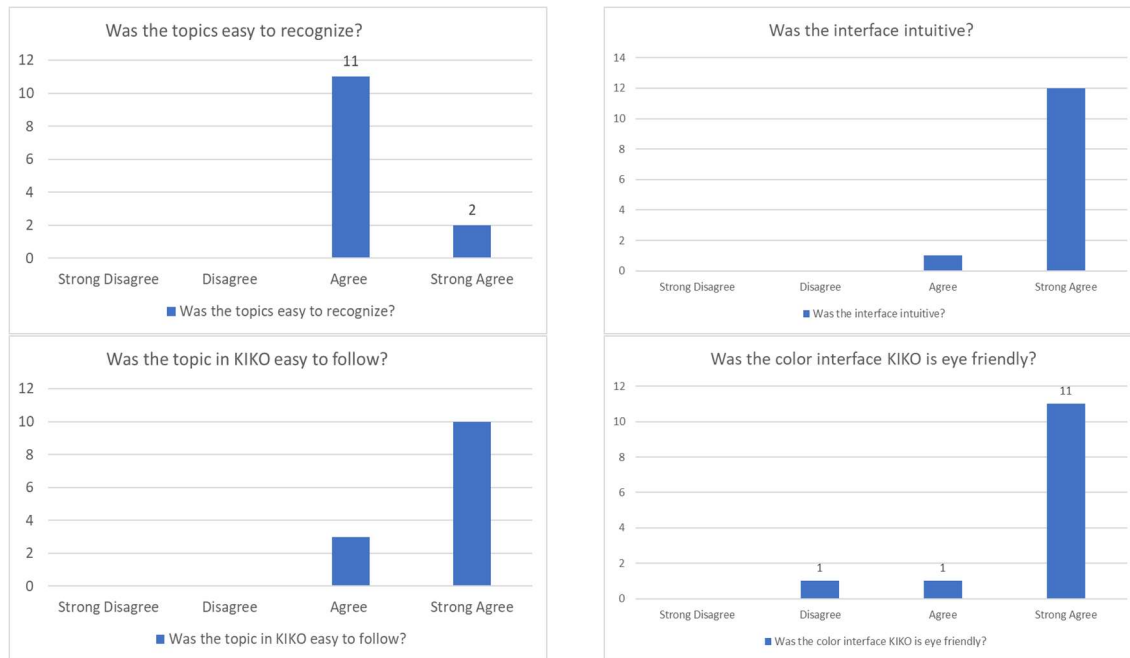


Figure 16: Results of Content by Students

4.2.3 Chart of User Interface for Students

The platform's uncomplicated and intuitive user interface is the reason that 92% of the 13 students highly concur that it is simple to navigate, as illustrated in Figure 17. The interface is perceived as intuitive by 92% of students, as a result of the plain and logical arrangement of buttons and content. This enables them to acclimate to and effectively utilize the system without the need for elaborate instructions. Moreover, 84% of students strongly concur that the interface's color scheme is visually accommodating, engineered for prolonged usage without inducing eye fatigue. The figure indicates that 69% of students highly concur that the podcast layout is aesthetically pleasing. Nonetheless, 54% of students strongly concur that the platform substantially encroaches upon their study time.



Figure 17: Results of User Interface by Students

Table 6 presents a summary of the students' comments.

Table 6: Result Summary for Students

Question Type	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Usability	0%	0%	26.15%	73.85%	100%
Content	0%	9.23%	53.85%	36.82%	100%
User Interface	0%	3.08%	20%	76.92%	100%

4.3 Multimedia Experts

The assessment for the multimedia specialists included two instructors and one graphic designer, who filled out a questionnaire addressing multimedia components such as color application, audio, video, typography, and the general design of the system. The gathered data were examined, and the findings displayed on a chart.

4.3.1 Chart of Functionality for Multimedia Experts

Figure 18 indicates that 67% of the three multimedia specialists concur, while 33% strongly concur, that the audio and video quality remains clear across the themes. Concerning the clarity of the language employed, 67% of the experts strongly concur, and 33% concur that the language is comprehensible, given that the system utilizes English. Nonetheless, 33% of the experts concur or strongly concur, while 34% dissent regarding the compelling presentation of the material, likely attributable to the rudimentary user interface and restricted interactivity. Furthermore, 67% of the experts concur, and 33% strongly concur, that the learning material is comprehensible due to its clear presentation. Ultimately, 67% of the experts concur, and 33% strongly concur, that the information is adequately thorough.

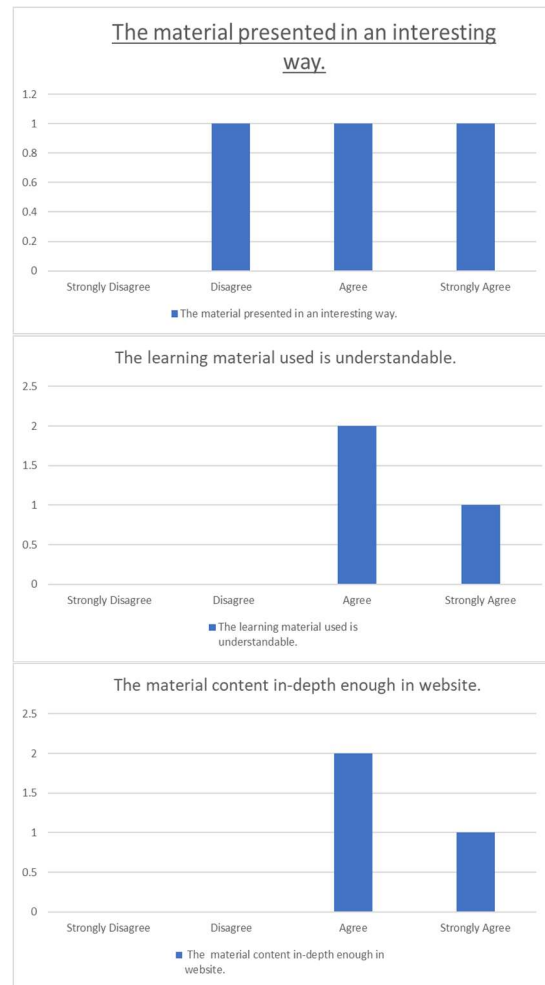
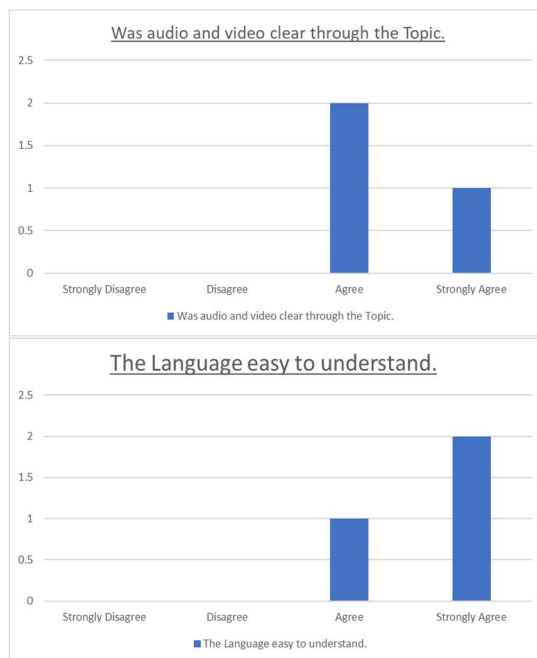


Figure 18: Results of Functionality by Multimedia Experts

4.3.2 Chart of Learnability for Multimedia Experts

Figure 19 shows that 67% of the three multimedia experts strongly agree that the website's content is easy to understand. They say this is because the information is organized in a clear way. Also, 67% of the experts agree that the information is clear and to the point because the style is simple, which makes it easy to find your way around. However, 33% of the experts strongly agree or agree that the website's content has a significant impact on users, while 34% disagree, which may be due to the limited interactivity provided. Finally, 67% of the experts strongly agree, and 33% disagree that they are impressed with the system, noting that the website's concept is effective in meeting its intended purpose.

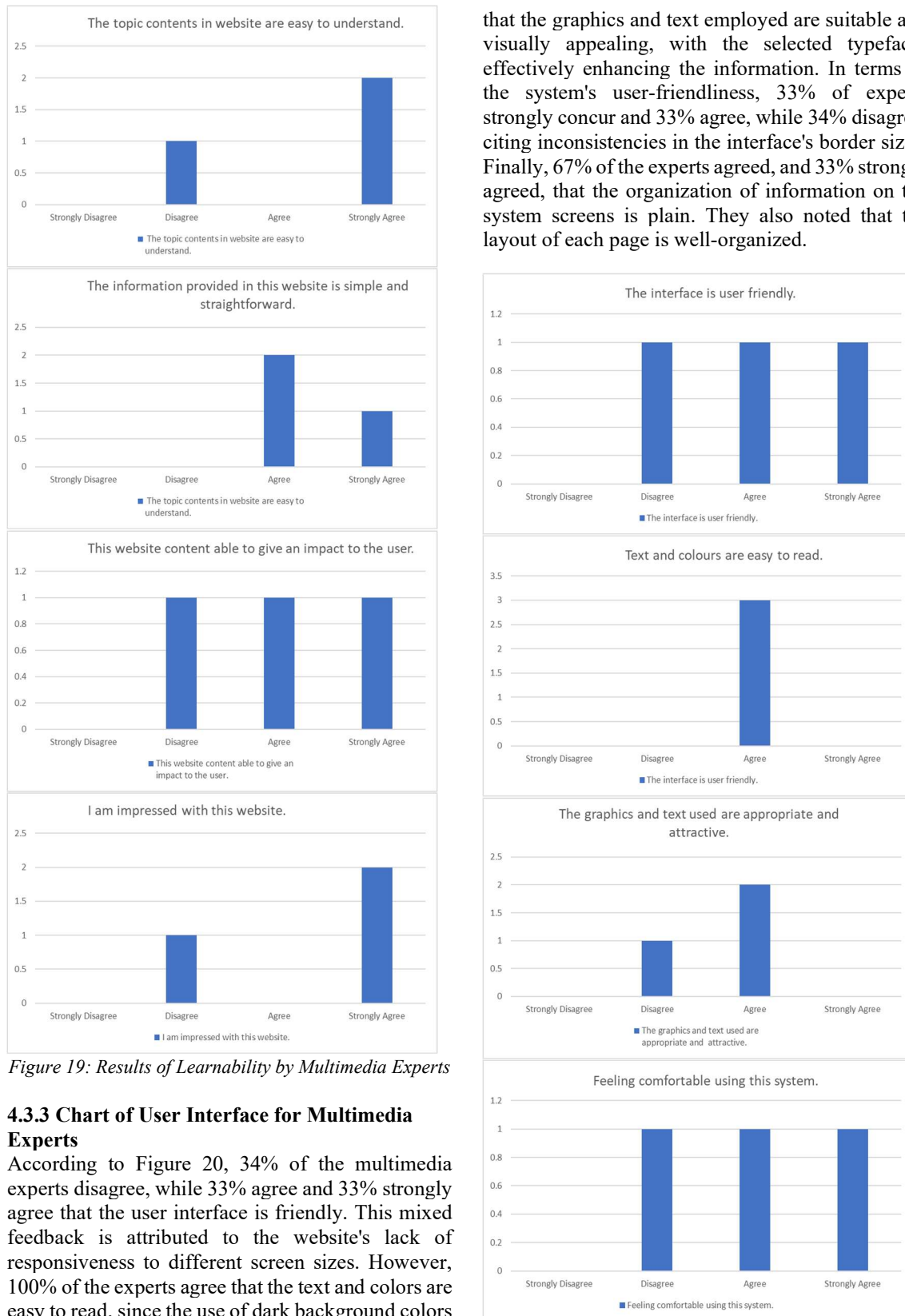


Figure 19: Results of Learnability by Multimedia Experts

4.3.3 Chart of User Interface for Multimedia Experts

According to Figure 20, 34% of the multimedia experts disagree, while 33% agree and 33% strongly agree that the user interface is friendly. This mixed feedback is attributed to the website's lack of responsiveness to different screen sizes. However, 100% of the experts agree that the text and colors are easy to read, since the use of dark background colors that make the text stand out. The chart also indicates that 67% of the experts concur, while 33% disagree,

that the graphics and text employed are suitable and visually appealing, with the selected typefaces effectively enhancing the information. In terms of the system's user-friendliness, 33% of experts strongly concur and 33% agree, while 34% disagree, citing inconsistencies in the interface's border sizes. Finally, 67% of the experts agreed, and 33% strongly agreed, that the organization of information on the system screens is plain. They also noted that the layout of each page is well-organized.

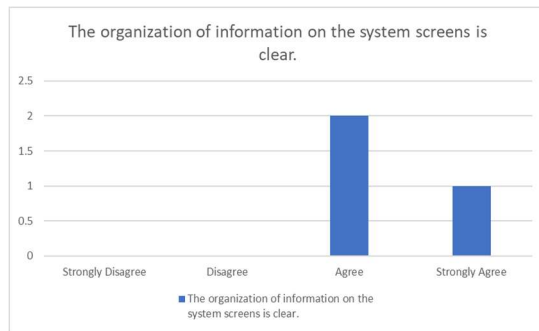


Figure 20: Results of User Interface by Multimedia Experts

A summary of the responses from the multimedia experts is presented in Table 7.

Table 7: Result Summary for Multimedia Experts

Question Type	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Functionality	0%	6.67%	53.33%	40%	100%
Learnability	0%	20%	33.33%	46.67%	100%
User Interface	0%	20%	60%	20%	100%

5. DISCUSSION

In numerous respects, the podcast platform is confronted with numerous limits. Subject matter experts have identified navigational issues, as the present page is not clearly indicated, and administrators are restricted in their abilities, as they are only able to upload episodes and are not enabled to create new topics. Furthermore, they emphasized the lack of interactivity, recommending the inclusion of features such as note-taking and surveys, as well as the necessity of improved video display, such as consistent thumbnail appearances and larger previews. Multimedia professionals suggested that the visual appeal be enhanced by incorporating iconography, refining the UI/UX design, and optimizing font usage. Students recognized the importance of a folder function to simplify the organization of episodes, a playlist layout that is more visually appealing, mobile responsiveness, and a concise tutorial to help users navigate the system more rapidly.

In particular, the podcast platform's user interface is well-designed, with a particular emphasis on the effective use of color and graphics. The color scheme is meticulously selected to generate a visually appealing and pleasurable

experience, which in turn improves user engagement and retention, as discussed by the students. This smart design makes the website look better and work better at the same time.

To augment the podcast platform, various enhancements can be instituted. A concise tutorial for novice users, presented through a tutorial video or sequential popup messages, would enhance the onboarding process. A succinct and persuasive promotional video could be created to attract and captivate potential customers. Incorporating pop quizzes after episodes can enhance engagement and reinforce key topics, while a note-taking feature during video playback would enable viewers to record important thoughts. Augmenting administrative capabilities to include the generation of new subjects and the alteration of episode data will yield increased flexibility. The incorporation of supplementary graphic thumbnails, especially for video material, would significantly improve the platform's visual appeal.

6. CONCLUSION

This study critically assesses the efficacy of an interactive educational podcasting platform in higher education, in accordance with its research aims. The findings indicate that the platform significantly enhances student engagement and learning outcomes, thereby fulfilling its objective of improving educational experiences via digital innovation. The platform provides customized information across many disciplines in interactive media courses, facilitating personalized and accessible learning while addressing significant educational disparities. The involvement of subject matter experts, multimedia specialists, and students in the experiment enhances the credibility of the results, demonstrating that an interactive podcasting format can function as an effective educational resource. These results indicate a significant potential for these platforms to revolutionize conventional educational methods, prompting more research and collaborations to enhance and broaden their uses in diverse educational environments.

The Interactive Media Podcast substantially enriches higher education by providing a user-friendly environment tailored for learning interactive media. Its interesting and easy design makes it a useful resource for students wanting to comprehend and master numerous topics. As a comprehensive learning hub, it offers a plethora of knowledge and possibilities for students to explore and enhance their expertise in new areas.

In conclusion, this study emphasizes the revolutionary power of interactive educational podcasting platforms in higher education. By leveraging digital technology, these platforms provide a unique way to improve learning experiences and close educational disparities. The study of the specialized podcasting website demonstrated a considerable increase in student engagement and learning outcomes, demonstrating its effectiveness as an educational tool. It will be essential to conduct ongoing research and collaboration in order to refine the features of these platforms and enhance their effectiveness as they continue to develop. The positive results of this study suggest that interactive educational podcasting has the potential to significantly influence the future orientation of higher education by becoming a critical driver in its evolution with further development.

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