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Immersive Campus Navigation: A Virtual Reality Model of Daffodil International University

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ABSTRACT

This research contributes to the body of knowledge regarding the lack of interactive navigational applications in higher educational institution campuses by creating an immersive Virtual Reality model of Daffodil International University. A gap in the literature exists, as the majority of VR-related applications are geared towards gaming or general learning, with few, if any, dedicated to campus exploration and navigation for ease of access. The research employs a mixed methodology by utilizing Unity 3D and Blender to create a 3D VR campus with navigational tools. Through a survey of 120 students, 107 (89.6%) stated that the VR model improved their campus orientation experience, while 9 (7.5%) stated it offered a moderate outcome, and 3 (2.8%) found it minimally helpful. Thus, the model was effective. The results and discussion section confirm practical, real-world implications for new student orientation, visitor access and tutoring, and opportunities for digitized marketing efforts. Ultimately, this research adds to the current body of knowledge by establishing VR campus navigation as a replicable process with significant value for other academic institutions to pursue.

INTRODUCTION

The recent advancement of immersive technologies (particularly virtual reality (VR), augmented reality (AR), and mixed reality (MR)) has fundamentally, and in an exciting way, changed the way users interact with digital content. The use of Virtual Reality in different verticals such as education, healthcare, training, architecture, tourism, gaming, and many more speaks to its versatility. VR allows users to engage and interact with real real-time three-dimensional (3D) environment that you can explore, embodying presence and immersion that is difficult to replicate in either traditional two-dimensional content or even mixing reality and 3D environments with traditional interventions. Virtual Reality is something that has the power to make our world closer and closer together; we can sit anywhere in the world and feel the sensation of another place by virtual reality, which is unimaginable.

The idea of VR dates back to the 1960s, but only in recent years has it become inexpensive and practical for everyday use with the emergence of affordable hardware such as the Oculus Rift, HTC Vive, Sony PlayStation VR, and mobile-based systems such as Google Cardboard. Likewise, there has been an incredible amount of growth in software development environments, and more importantly, game engines like Unity and Unreal Engine, which are now essential in realizing VR content.

Unity has quickly established itself as one of the leading platforms in interactive VR experience design. Unity's interface is intuitive and easy for user, it supports numerous platforms and has a strong developer community composed of a million supporters. The Unity platform supports a wide range of devices and provides a complete set of tools for creating rendering scenes, object physics, UI/UX, and scripting in C#. In addition, with the integration of vendor-specific VR SDKs, developers and researchers can create high-performance virtual environments without dealing with additional complexity (Alotaibi, 2024).

To do this, this work will unpack the creation and utilization of VR environments in Unity. The technical workflow for creating interactive VR applications with Unity will be covered; 3D modelling, game-view cameras, UI's, and interactions will be focused. And some of the most common developer headaches like performance across platforms and compatibility.

While serious applications for VR technology are not what it is most known for (entertainment, games), many areas of study have impactful implications, and fields of study that could leverage the use VR. First, another area is education, where VR can be used to deliver experiences that allow for new interactive learning models that are certainly hands-on and in some cases may increase comprehension. Second, fields pertaining to medicine, where VR can be used in simulations to provide students the ability to rehearse procedures in a safe, repeatable, and risk-free way. Finally, the use of VR in social sciences and behavioral studies is an even more relevant notion as it can allow for controlled experiments that resemble realistic scenarios (Adam, 1993).

While there are many advantages, there can be drawbacks

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to VR development. Issues like motion sickness, costly and powerful hardware, limited field of view, and thrusting complex development processes aside still keep many obstacles in the way of widespread adoption. In addition, VR research is still fragmented across disciplines, so it is important to create a more shared knowledge of best practices, development methods, and user experience design (Anthes *et al.*, 2016).

In this paper, we demonstrate how to develop a VR application in Unity, focusing on the technical aspects of the solution and maintaining a user-centered approach, similar to a design-centered approach. We have identified some more key limitations and proposed guidance to further enhance the attempt to develop VR application in the future. We hope that by making further contributions to such work, we will be able to help developers, teachers and researchers to create rich and more dominant digital experiences using VR (Basheer *et al.*, 2022).

LITERATURE REVIEW

Virtual Reality in Education

Virtual Reality (VR) has changed educational approaches through its ability to deliver deep learning activities that conventional instruction methods lack (Chavez &Bayona, 2018; Brookes *et al.*, 2020). Virtual Reality technology provides learners with the chance to join authentic simulations through which they develop better spatial awareness and increased engagement and improved information retention. Virtual Reality laboratories grant students the ability to conduct intricate experiments in a safe and repetitive manner which strengthens their learning results (Chavez & Bayona, 2018). Educational VR applications mainly focus on visual quality and technical interactivity instead of conducting systematic assessments of learning achievements (Chen *et al.*, 2011).

Virtual Reality in Navigation and Spatial Learning

VR technology functions as a standard tool for navigation and spatial learning research because it enables users to experience complex virtual environments while receiving structured guidance through their navigation practice (Bowman & McMahan, 2007; Brookes *et al.*, 2020; Tuyen, 2025). The systems produce authentic spatial arrangements which help scientists study how people create mental maps and how they remember and find their way around. The majority of VR navigation initiatives concentrate on technical advancement and visual excellence instead of establishing proper assessment methods for user performance and learning results (Chen *et al.*, 2011; Sibya *et al.*, 2025).

Comparative Insights

Multiple research studies about VR technology show particular patterns which appear consistently throughout their findings.

Technical Emphasis

The dominance of research studies focuses on achieving superior interpretation quality and ensuring sleek hardware operation and interactive system design (Brookes *et al.*, 2020).

Limited User-Based Evaluation

The research contains only a small number of studies which establish direct connections between virtual reality experiences and calculative educational or navigational results (Chen *et al.*, 2011).

Segmented Research

The research about virtual reality exists in different academic fields but studies show limited collaboration between educational theories and technological development for VR systems (Bowman & McMahan, 2007; Yoh, 2001).

Research Gaps and Contribution

Virtual reality technology has expanded its applications but several major deficiencies continue to exist.

Evaluation Frameworks

Controlled experiments assessing learning and navigation outcomes are rare (Chavez & Bayona, 2018).

Long-Term Learning

Research studies tend to focus on immediate results but they seldom examine how well students keep their knowledge over time or apply what they have learned in different situations (Brookes *et al.*, 2020).

Cross-Disciplinary Integration

Associating VR technical expertise with educational psychology and cognitive science is still uncommon.

The research study creates a unified VR development and evaluation system to solve these problems. The research paper establishes a connection between virtual reality system development and user behavior analysis through a structured framework which enables cognitive performance and user interaction measurement. The research study achieves practical and theoretical goals through its method which unites immersive virtual reality experiences with user-centered evaluation systems to advance educational navigation within virtual reality environments (Chavez & Bayona, 2018).

Research Question

1. How can the VR tech allow an interactive and immersive simulation of a real University Campus?
2. What is the realism and user engagement of a mobile-VR compatible application?
3. Why is a virtual campus tour better in terms of user comprehension and user experience than conventional photos or videos?
4. Will-based visualization will follow accessibility and promotion of universities such as Daffodil International University and college?
5. Will it satisfy the users?

Research Objective General Objective
To develop an interactive Virtual Reality simulation of Daffodil International University's Permanent Campus, providing users with a means to virtually experience and navigate their campus environment.

Specific Objective
1. To design and model a realistic 3D simulation of the university campus in Unity3D, C#, and JavaScript.
2. To deploy the VR and VR simulation on Android for use with VR Box headsets.
3. To allow user engagement in the virtual environment regarding free access and choosing their own route.
4. To evaluate the user experience as it relates to realism, engagement, and navigation training.
5. To showcase the potential of Virtual Reality as a modern tool for campus promotion and remote engagement.

MATERIALS AND METHODS

The research study employed a survey method using questionnaires as a tool to evaluate the virtual reality campus model at Daffodil International University (DIU) which used affordable VR technology. The development team built the VR system through Unity3D which executed C# and JavaScript scripts within the Windows environment. The design team worked to develop a budget-friendly solution which could expand effectively through its compatibility with affordable VR Box headsets and normal Android devices.

Participant Selection
Researchers used convenience sampling to obtain a sample of 106 participants from Daffodil International University and these particular people were chosen based on their availability and importance to the overall study. The sample consisted of 98 students enrolled at the time, 3 students looking to enroll, 3 guardians, and 2 others. They volunteered their time to respond to the survey as these people represent the real-life stakeholders who would experience the VR campus. The age demographic skewed young with 88.7% between 21–25 years, and the most respondents were university students. Convenience sampling may have led to some biased results but overall, the focus group reflects the anticipated audience. Surveys were completed through Google Forms to ensure organized data collection and ease of assessment.

Evaluation Criteria and Instruments
A structured questionnaire based on a 5-point Likert scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) was used to measure user experience. The evaluation process required specific criteria which needed to be established.
1) The reality level of the VR world.
2) The simplicity of navigation.
3) The system's user-friendly features.
4) Being able to understand the layout of the campus in space.
5) The number of people showing interest in Daffodil International University has increased.
6) The user-friendliness of Android and the VR Box system.
7) The ability to teach and do digital marketing.

Testing Protocols
Users accessed the VR system through their personal Android devices along with the VR Box headsets which the organizers supplied. The visitors had between 10 and 15 minutes to explore the campus during each session because that timeframe allowed them to view all the main attractions. The participants completed the questionnaire after their involvement in the study.

Validation Methods
Survey results were compiled through Google Forms to ensure easy access and systematic data collection. Reliability was assessed with a Cronbach's Alpha, and descriptive statistics were calculated by frequency and percentage. The reliability of the survey tool was high with a Cronbach's Alpha of $\alpha = 0.87$. Such disclosure lends credibility to the results and allows for replication.

Hardware Used to Develop the VR System

Table 1: Hardware Used to develop the VR system

Platform	Specifications
Windows	Windows 7 SP1+/10 (64-bit), x64 processor with SSE2, DX10+ compatible GPU
Android	Android 4.4+, ARMv7/ARM64 architecture, 1GB+ RAM, OpenGL ES 2.0+ support

Table 1 outlines the minimum hardware specifications necessary for both the development environment and the end-user platform. The development environment was to be on a Windows operating system as in the end, the minimum hardware specification must consist of Windows 7 SP1 or Windows 10 (64-bit) - a 64-bit processor and instruction set capable of using the SSE2 instruction set - a Graphics Processing Unit (GPU) capable of supporting DirectX 10 or higher. There were selected specifications to ensure a smooth, supported development, testing, and rendering within the Unity3D engine.
The VR app is developed for use with Android devices with a minimum of Android version 4.4 and above, ARMv7 or ARM64 architecture, 1GB of RAM minimum, and OpenGL ES 2.0 or above. The above hardware parameters will ensure that the application runs well on almost all Android-based VR headsets, even on budget models such as the VR Box, assuring performance and accessibility (Davis *et al.*, 2022).

Tools and Technologies Used
We see tools with intents in Table 2. The research work

Table 2: Tools and Technologies Used

Tool/Technology	Purpose
Unity3D	Primary development platform for 3D VR simulation
Photoshop	Design of textures, images, and UI visuals
Visual Studio	Coding environment for C# scripts used in Unity
Google-VR SDK/ NDK	Integration of VR functionalities with Android VR devices
C#	Backend logic and interaction scripts
JavaScript	Front-end development and UI interactivity

consisted of applying the following software tools and technologies: as you have seen above, we used our relevant software tools and technologies according to the defined intent of the VR system and technical requirements of the research. The particulars are below.

Unity3D

Unity3D viewed as the primary engine for development for the VR simulation. Unity3D offers a easy to use interface for 3D rendering and scene development which is important for creating the interactive campus setting (Gobbetti & Riccardo, 1998; Diamante, 2023; Wang *et al.*, 2010).

Photoshop

Tasked with designing and developing textures, graphics and images to be mapped on 3D models intended for use on Unity. It assisted maintaining clear and appealing visuals.

Visual Studio

The integrated development environment (IDE) allowed for C# programming that could interface with Unity3D (Pan *et al.*, 2006).

GoogleVR SDK and NDK

Native Development Kits (NDKs) are a pack of tools that can use C and C++ code on Android to take measures a entresol sanctum for governing native dynamism and accessing physical device components such as sensors and touch inputs. We accessed and managed local machines with Google Cloud Services. We add VR functions through the SDK (Guttentag, 2010; Hussain, 2025; Kuang & Bai, 2018).

Programming Languages

C# and JavaScript are used for this research. C# is for back-end design, and JavaScript is used to do front-end work.

Use Case Model

In Figure 1, The most notable cases of use for this system include Virtual DIU, Map, About Us, About DIU, and Exit. The use case diagram depicts user actions associated with the VR platform, mapped out over a basic navigational layer.

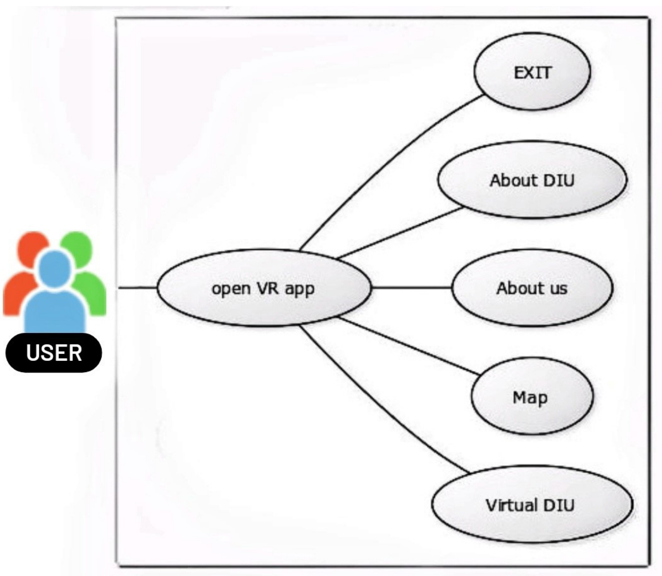


Figure 1: Use case diagram of our project.

Data Flow Diagram (DFD)

As shown in Figure 2, the diagram gives us complete view of how the system works. We can see all the buttons in this diagram.

Simulation Process

As shown in Table 3, the simulation process was important step in creating a VR system. In Figure 3, images taken in 360-degrees, were imported into Unity in

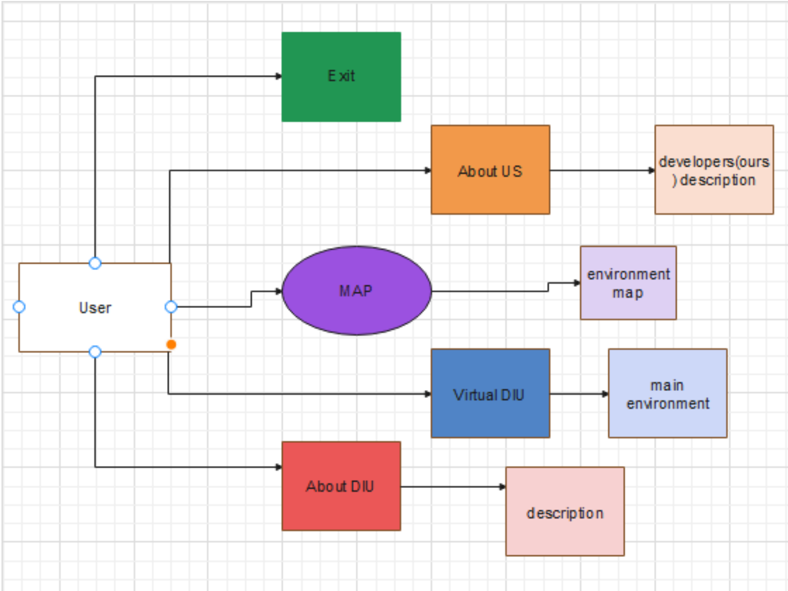


Figure 2: Data flow diagram of our project

Table 3: Simulation Process Summary

Step	**Description**
Capturing Image	360° images of DIU
Image Mapping	Mapped onto spheres in Unity
Scene session	Simulate real navigation in Unity
VR Compatibility	Integrated with VR Box and Android using GoogleVR SDK for immersive support

order to create realistic representation in the VR realm of the DIU Permanent Campus. Images were placed on the surface area of spheres, laid out in space within the virtual environment, to give a spherical panoramic feel.

The Unity platform is used to build the environment of 360degree view of Daffodil International University campus by using those steps. For virtual reality, unity is the best choice to do the work perfectly (Jerald *et al.*, 2014; Viitanen *et al.*, 2018; Xie *et al.*, 2021).

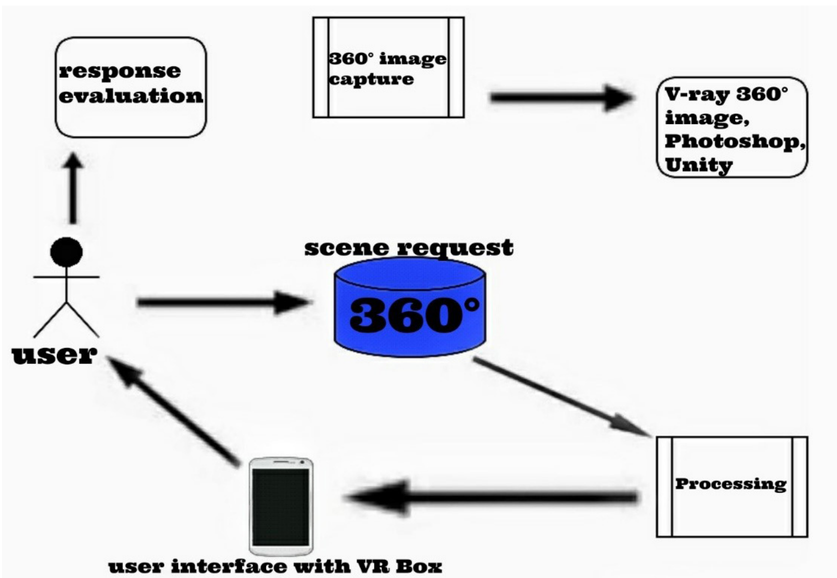


Figure 3: Simulation Process of the system

Design Specifications

Table 4: System Design Specifications

Component	Description
Front-End	JavaScript for UI design; Photoshop for layout and visual design
Back-End	C# scripts for data handling and interaction logic using Visual Studio

As shown in Table 4, we can see that, the two components are: Front-End and Back-End, we can also see the description in that table. More are given below.

Front-End

To provide a neat, intuitive design, the interactive components were created using JavaScript and the visual elements with Photoshop (Zyda, 2005).

Back-End

Developed in Visual Studio, C# scripts were referenced into Unity to handle scene changes, user selections, and to forward data from the user to the system.

Virtual Reality Integration

Unity's built-in VR settings, combined with GoogleVR SDK, use the built-in features to generate seamless experiences across all VR platforms, so giving the best possible VR experience for Android-based devices.

The spheres used in the design in Figure 4 help to show the different 360-degree images in Unity.

Figure 5 shows the environment scene in Unity, we can see the view of the campus in VR mode here.

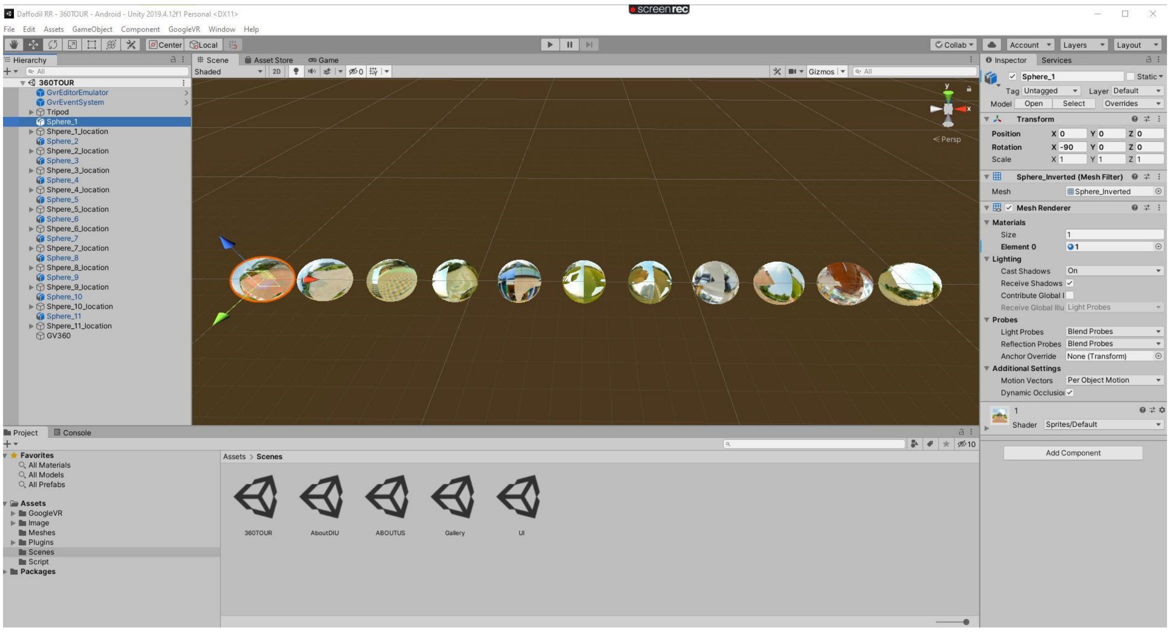


Figure 4: Spheres part of the project

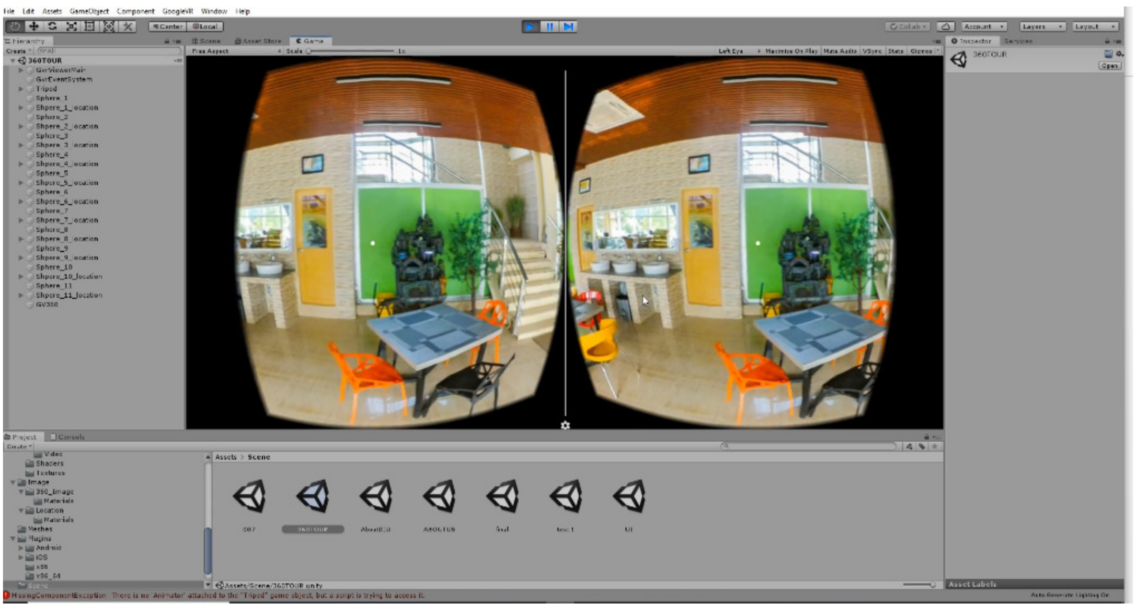
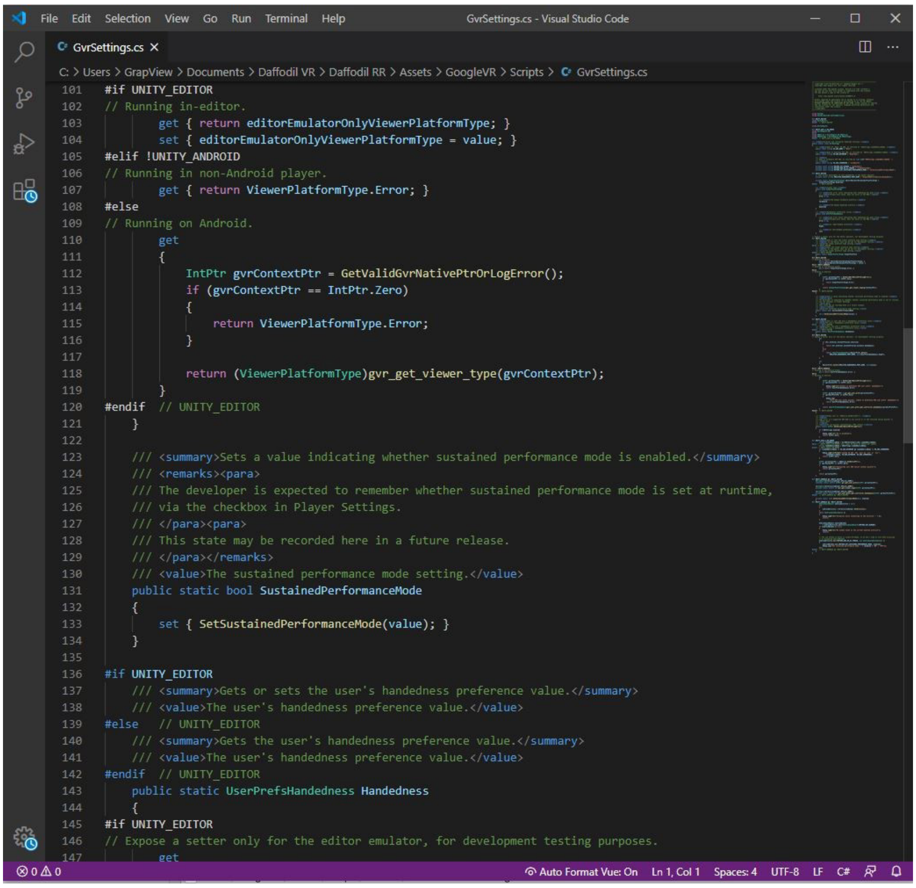


Figure 5: Environment Scene in Unity of the project



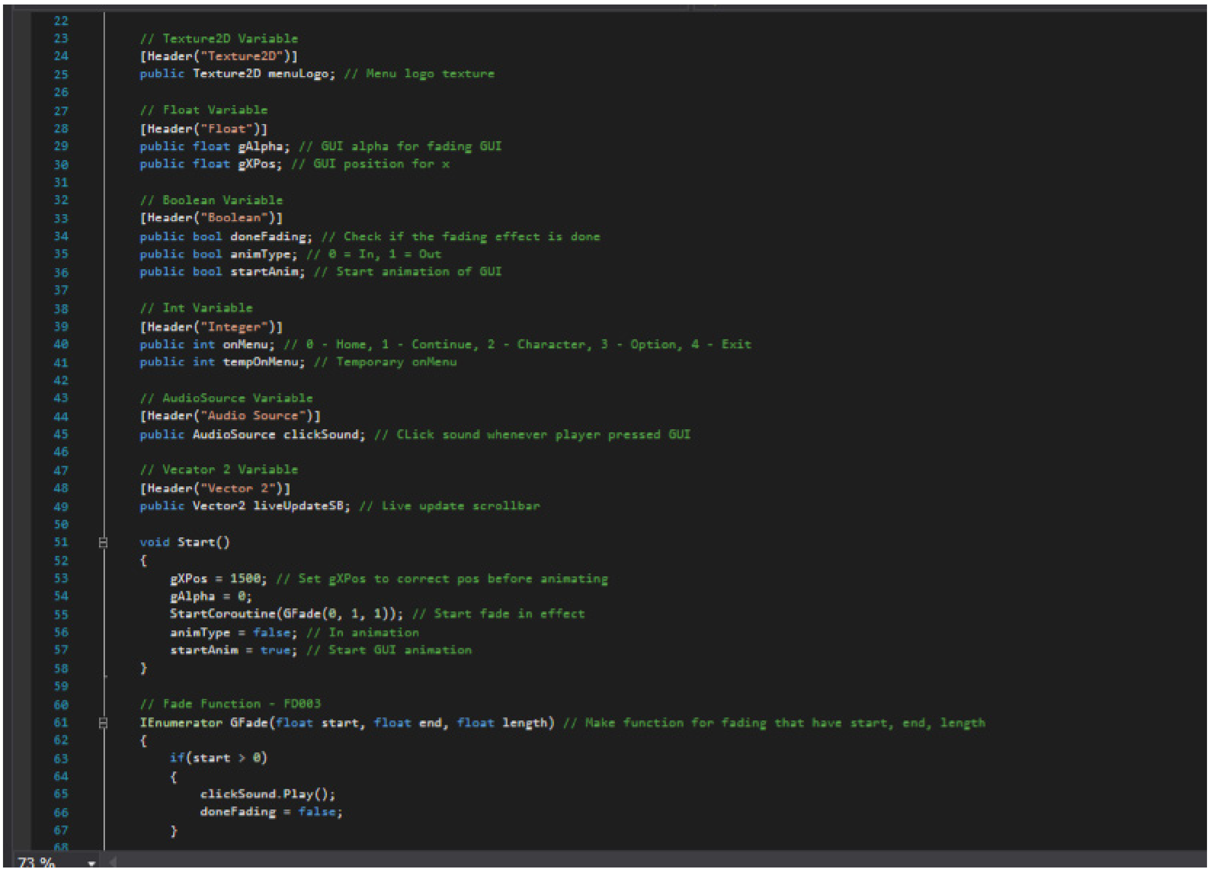
```
#if UNITY_EDITOR
// Running in-editor.
            get { return editorEmulatorOnlyViewerPlatformType; }
            set { editorEmulatorOnlyViewerPlatformType = value; }
#elif !UNITY_ANDROID
// Running in non-Android player.
            get { return ViewerPlatformType.Error; }
#else
// Running on Android.
            get
            {
                IntPtr gvrContextPtr = GetValidGvrNativePtrOrLogError();
                if (gvrContextPtr == IntPtr.Zero)
                {
                    return ViewerPlatformType.Error;
                }

                return (ViewerPlatformType)gvr_get_viewer_type(gvrContextPtr);
            }
#endif  // UNITY_EDITOR
        }

        /// <summary>Sets a value indicating whether sustained performance mode is enabled.</summary>
        /// <remarks><para>
        /// The developer is expected to remember whether sustained performance mode is set at runtime,
        /// via the checkbox in Player Settings.
        /// </para><para>
        /// This state may be recorded here in a future release.
        /// </para></remarks>
        /// <value>The sustained performance mode setting.</value>
        public static bool SustainedPerformanceMode
        {
            set { SetSustainedPerformanceMode(value); }
        }

#if UNITY_EDITOR
        /// <summary>Gets or sets the user's handedness preference value.</summary>
        /// <value>The user's handedness preference value.</value>
#else   // UNITY_EDITOR
        /// <summary>Gets the user's handedness preference value.</summary>
        /// <value>The user's handedness preference value.</value>
#endif  // UNITY_EDITOR
        public static UserPrefsHandedness Handedness
        {
#if UNITY_EDITOR
// Expose a setter only for the editor emulator, for development testing purposes.
            get
```

Figure 6: Some C# code of the project



```
    // Texture2D Variable
    [Header("Texture2D")]
    public Texture2D menuLogo; // Menu logo texture

    // Float Variable
    [Header("Float")]
    public float gAlpha; // GUI alpha for fading GUI
    public float gXPos; // GUI position for x

    // Boolean Variable
    [Header("Boolean")]
    public bool doneFading; // Check if the fading effect is done
    public bool animType; // 0 = In, 1 = Out
    public bool startAnim; // Start animation of GUI

    // Int Variable
    [Header("Integer")]
    public int onMenu; // 0 - Home, 1 - Continue, 2 - Character, 3 - Option, 4 - Exit
    public int tempOnMenu; // Temporary onMenu

    // AudioSource Variable
    [Header("Audio Source")]
    public AudioSource clickSound; // Click sound whenever player pressed GUI

    // Vecator 2 Variable
    [Header("Vector 2")]
    public Vector2 liveUpdateSB; // Live update scrollbar

    void Start()
    {
        gXPos = 1500; // Set gXPos to correct pos before animating
        gAlpha = 0;
        StartCoroutine(GFade(0, 1, 1)); // Start fade in effect
        animType = false; // In animation
        startAnim = true; // Start GUI animation
    }

    // Fade Function - FD003
    IEnumerator GFade(float start, float end, float length) // Make function for fading that have start, end, length
    {
        if(start > 0)
        {
            clickSound.Play();
            doneFading = false;
        }
```

Figure 7: Some C# code of the project

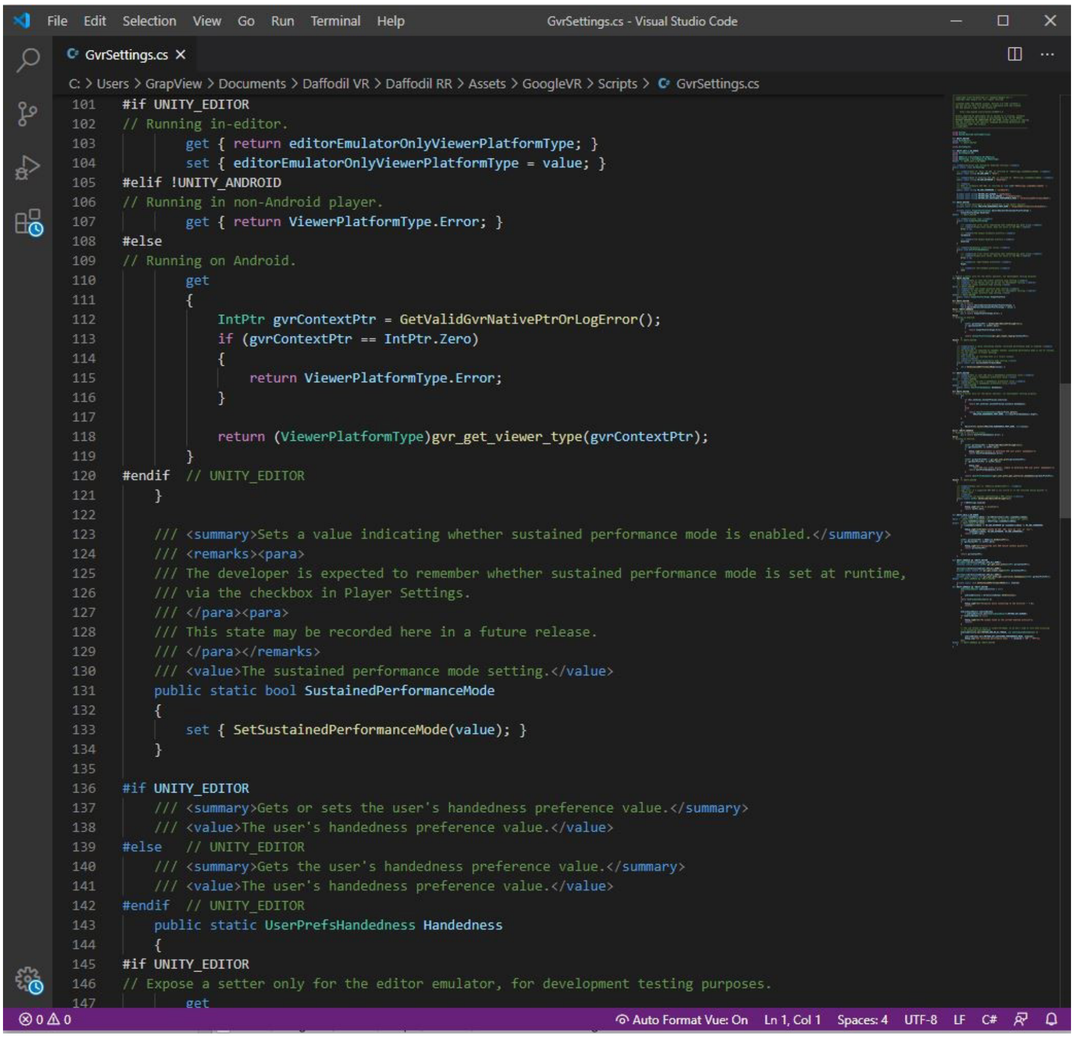


Figure 8: Some C# code of the project

Data Analysis and Presentation
Demographic Information
Total Respondents 106

From the survey method using questionnaire as a tool, we get the participants age, background, their experience by using VR and their overall satisfaction about VR system by using it by their own. Those pieces of information are given below by using tables and charts with descriptions.

Table 5: Age

Age	Frequency	Percentage
18-20	7	6.6%
21-25	94	88.7%
26–30	1	0.9%
30+	4	3.8%

Table 6: Background

Background	Frequency	Percentage
Current DIU student	98	92.5%
Prospective student	3	2.8%
Parent/Guardian	3	2.8%
Other	2	1.9%

Table 5 and Table 6 shows that, maximum people's age are between 21 to 25 and maximum students with a number of 98 are current DIU students, Prospective students are 3, Guardians are 3 and 2 are other people. They are the people who participated in this survey.

VR Experience Evaluation (Likert Scale)

By giving some options, 106 people are asked if they agree with some Likert-scale statements or not. Those statements are:

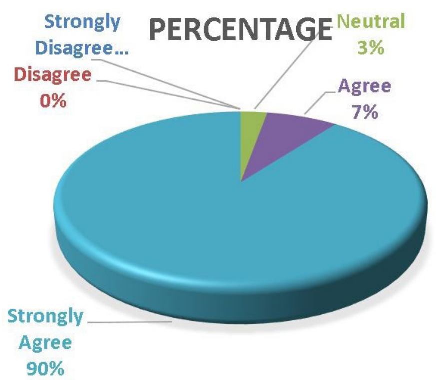


Figure 9: VR Experience Evaluation Chart

1) The VR environment seemed real.
2) It was easy and natural to find your way around the campus in the VR system.
3) It was easy to use the VR system.
4) The VR tour helped me get a better idea of how the campus is laid out.
5) The VR experience made me more interested in DIU.
6) It was easy to use an Android phone with a VR Box.
7) This VR experience can be helpful for learning and marketing online.

Figure 9 shows that, 90% of the people strongly agree, 7% agree and 3% are neutral with the Likert-scale statements.

Table 7: Overall Satisfaction

Response	Frequency	Percentage
Excellent	95	89.6%
Good	8	7.5%
Average	3	2.8%
Poor	0	0%
Very Poor	0	0%

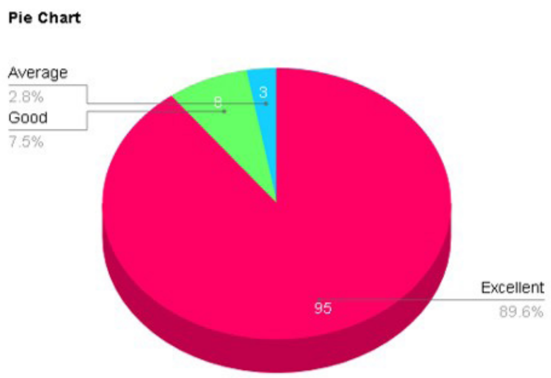


Figure 10: Overall Satisfaction Chart

Here, in Table 7 and Figure 10, in the overall satisfaction, 89.6% people choose Excellent, 7.5% people are with Good, and 2.8% people choose average.

RESULT AND DISCUSSION

According to the survey results, 89.6% thought the VR campus setting was very realistic, easy to use, and engaging, 7.5% received moderate results and 2.8% received minimal results. Thus, the results support that this immersive VR model for Daffodil International University is an effective means to improve user orientation and engagement with the institution. The majority of respondents were in the 21-25 age range, reflecting the targeted student population, although there were some parents and potential students as well.

In comparison to past research on VR, these findings correlate with prior developments while also contributing new data. Much prior research assessed VR for entertainment purposes or within the classroom environment (Nguyen & Dang, 2017; Mohamad & Jihad, 2023), while this study assessed a new approach to VR for navigation and accessibility within a campus setting. Furthermore, the past assessment required high-tech hardware and expensive VR systems; however, this model shows that low-budget, readily-available devices such as the Android phone and VR Box can yield similarly positive levels of engagement. This is a new contribution to the field as it provides a basis for implementation in low-budget situations.

Yet a critical review notes some shortcomings. First, the sample of participants was primarily limited to current students (92.5%), with only a handful of parents and prospective students, meaning replicating results would not be generalizable across all stakeholder groups. Second, the VR system was limited to a specific device and download, increasing accessibility challenges while also providing lower resolution than some high-end VR systems used today. While the video quality did not impede user performance within the study, it is a recommendation for further adjustments to broaden compatibility and ensure full immersion.

Ultimately, however, the findings are consistent with successfully meeting the research goal to provide a low-cost, easily accessible VR access for campus navigation. The positive feedback surrounding the model demonstrates that it can assist with student orientation, parent and visitor navigation, and part of the digital campus marketing tools in the future. Ultimately, it fulfills an academic, institutional, and communicative gap in VR technology application by contributing to the growing body of literature on its practicality for higher education and establishing a repeatable model for other institutions.

Findings

The study produced the following results.

1) The permanent campus of Daffodil International University became accessible through a virtual reality model which allowed users to experience realistic virtual tours that were both simple to navigate and highly immersive.
2) The evaluation system received feedback from 106 people who consisted of 92.5% current DIU students and 88.7% of the participants fell within the age bracket of 21 to 25 years.
3) The Likert-scale evaluation showed that 90% of users found the virtual reality space to be both realistic and easy to navigate and comfortable while it improved their understanding of the campus and made DIU more interesting to them.
4) The VR experience received positive feedback from 89.6% of participants who rated it as excellent but no one rated it as poor or very poor.
5) The system operated successfully on Android smartphones that used VR Box devices which demonstrated an economical solution for widespread adoption.
6) The model received positive feedback from current students and their guardians and future students who recognized its usefulness for digital marketing and educational outreach.

7) The research findings show that virtual reality (VR) technology enables better stakeholder involvement and institutional communication and hands-on educational experiences in Bangladeshi higher education institutions.

Testing Outcomes to Develop the VR System

Rigorous testing procedures were undertaken to validate the stability, usability, and performance of the system. Different levels of testing were conducted, each producing positive outcomes:

Unit Testing

Individual code modules were tested and validated during the development phase. Minor errors were detected and corrected immediately, ensuring the code's reliability and efficiency (Kumar & Telore, 2023).

Integration Testing

After integrating all modules, the system was tested as a whole. No significant issues were encountered during integration, which demonstrated the effective communication between front-end and back-end components (Lanier, 1992; Rabiu, Bako, & Ogundipe, 2025).

UI Testing (Air Test)

Automated UI tests were performed using image recognition technology. All interface elements, including action buttons and layout designs, were found to be responsive and functioning as intended (Mohamad & Jihad, 2023; Nguyen & Dang, 2017).

Motion Sickness Testing

Recognising the importance of user comfort in VR experiences, special attention was given to motion sickness evaluation. Sensitive users were selected to identify potential dizziness or discomfort. After minor adjustments, the VR experience was reported to be smooth and comfortable for all test participants (Safaan, 2023; Ojha, 2024).

Experimental Results Summary to develop the VR system

The experimental results are summarised below:

Table 8: Experimental Results Summary

Test Case	Outcome	Result
Application installation	Effectively initiated.	passed
UI and Action Buttons	Smooth Functionality	passed
Bugs and Error Checking	No Issues Found	passed
Motion Sickness Sensitivity	No Discomfort Detected After Fix	passed

Table 8 presents a concise summary of experimental outcomes across four key test cases, including installation, UI functionality, bug detection, and user comfort. Each test was successfully completed, indicating stable performance and effective error resolution. The results confirm that all core functions meet the intended objectives without issues.

Result: Figure 11 shows how the system works.

Figure 10: Virtual experience of Daffodil International University

CONCLUSION

Ultimately, this research yielded an effective, low-cost immersive VR solution for Daffodil International University, aimed at increasing campus wayfinding and accessibility. The survey findings show that 89.6% experienced better wayfinding efforts and immersion, relative to the research aims. Thus, the findings validate the application of low-cost VR for student orientations, campus wayfinding for guests, and possible future digital marketing. Limitations include a small and disproportionate sample size and potential performance issues with mobile VR devices. Future projects should carry larger and more proportioned samples with users of different backgrounds and enhanced VR technology to better performance for educational purposes. In conclusion, this research successfully highlights virtual reality as a low-cost, multifaceted, and engaging response to improve internal communication efforts while facilitating educational objectives.

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Conflict of Interest Statement

The researchers declare that there is no conflict of interest regarding the publication of this work.

Informed Consent

We have obtained informed consent from all individuals included in this study. All participants were made fully aware of the objectives of the research, and their participation was entirely voluntary. No personally identifiable information was disclosed, and participants retained the right to withdraw at any time without consequence.

Ethical Approval

The research described in this article was conducted in full compliance with all ethical standards of the institution of the authors. The investigation was conducted according to all ethical procedures required, with our study design, methods and purpose was reviewed and approved by the institutional ethics committee before undertaking the research study. This approval indicates that the study upholds professional and academic integrity and follows national and institutional policies regarding the ethical treatment of human participants and management of data.

Data Availability

The data that support the findings of this study are available from the corresponding author, Md. Naeem Aziz, upon reasonable request. Due to privacy and confidentiality considerations, the data are not publicly available but may be provided upon inquiry and subject to institutional approval.

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