

**REDEEMAR: A BIBLE LEARNING APPLICATION  
THROUGH AUGMENTED AND VIRTUAL REALITY**

A Capstone Project Presented to the Faculty  
of the Institute of Computer Studies  
Camarines Norte State College  
Daet, Camarines Norte

In Partial Fulfillment of the Requirements  
for the Degree of Bachelor of Science  
in Information Technology

by

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## **APPROVAL SHEET**

This capstone project titled **REDEEMAR: A BIBLE LEARNING APP THROUGH AUGMENTED AND VIRTUAL REALITY** prepared and submitted by Marc Joseph A. Andaya, Raisah Kamilah D. Dayto, and Clarence L. Velasco in partial fulfillment of the requirements for the degree in Bachelor of Science in Information Technology has been examined and is recommended for acceptance and approval for an oral examination.

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## **ABSTRACT**

Title: RedeemAR: A Bible Learning App through Augmented and Virtual Reality

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This research investigates the influence of augmented reality (AR) and virtual reality (VR) technology in the fields of education and biblical studies. This study reveals that AR, accessible on affordable smartphones, holds potential for tailoring educational solutions, especially for children. In the context of evangelical Christianity, the growing use of mobile devices for Bible reading underscores the importance of effective communication strategies within churches. In line with this, we developed the People of Promise's (POP) Bible learning application, utilizing augmented and virtual reality to enhance comprehension through multi-sensory learning experience and engage a tech-savvy younger audience. Employing the Rational Unified Process (RUP) methodology, we identified crucial information requirements and essential features for Bible learning applications. The evaluation, using the USE tool with 20 respondents from Daet, Camarines Norte, revealed a strong agreement for the usability of RedeemAR application with overall weighted mean of 4.82. Given these results, we can conclude that the use of augmented reality (AR) and virtual reality (VR) is an effective tool in teaching biblical lessons.

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The Researchers

## **DEDICATION**

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The Researchers

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## **Chapter 1**

### **INTRODUCTION**

#### **Context of the Study**

There has been an increase in demand for creative and interactive learning methods as a result of the development of technology and its incorporation into our daily lives. Augmented reality (AR), which offers users a distinctive and interesting learning experience, has recently emerged as a viable tool for educational purposes. Several industries, including marketing, entertainment, and education, have made use of this technology. The application in this research uses AR according to Martin (2021).

Virtual reality (VR) technology has the potential to revolutionize education by providing students with immersive and interactive learning experiences. VR can be used to create simulations of real-world environments, allowing students to explore and learn in a safe and controlled setting. VR can also be used to visualize complex concepts and processes in a way that is more engaging and easier to understand than traditional methods according to Wu et al. (2018). Similarly, this research uses virtual reality technology to create a new interactive learning experience for children.

More and more AR-based educational applications are becoming accessible, and even inexpensive smartphones now

support the presentation of AR material stated by Geroimenko et al. (2020). Furthermore, since new ideas for technology-enhanced learning through AR are only starting to take shape, the affordances of AR for learning have been extensively researched in the past ten years according to Chang et al. (2022).

The use of mobile technology for education in the developed world has increased from short-term trials on a small scale to large-scale integration, which has sparked an increase in the potential of mobile phone-facilitated learning in the developing world. Due to this, the number of children consuming media or technology then rises as stated by National Research Council (2013). This creates an opportunity for researchers to produce software or games that are suitable for children to use and aid in their ability to absorb knowledge.

On the other hand, reading the Bible digitally has gained popularity among Evangelical Christians, especially in the UK and the US. Mobile devices are commonly used during services and Bible study groups, replacing printed Bibles. This enables easy access to the text, note-taking, and sharing of important points on social media as per Hutchings (2017). The Christocentric change will be lacking in churches that do not deliberately consider how to effectively communicate biblical material. Churches must adopt an intentional focus on information if they are to

answer the demand for transformation, citing the word of Kimpel (2020).

People of Promise (POP), a church community founded by Kim North in 2016 at Magallanes Iraya St. Purok 6 Barangay Camambugan Daet, Camarines Norte, has been evangelizing in Daet, Camarines Norte for over seven years using traditional verbal methods.

As per Kimpel (2020), traditional verbal methods are not the most effective way of teaching today. Therefore, the researchers of this study proposed creating a Bible learning app that uses virtual reality to improve information retention and comprehension of Bible stories among POP's target audience for evangelism. The app also aims to encourage the younger generation, who are more likely to be technologically oriented, to study the Bible.

### **Research Objectives**

The purpose of this study is to develop a virtual reality learning application to evaluate the effectiveness of using technology for the learning of children who are being taught by the POP Student Center. Specifically, the study aims to:

1. identify the information requirements needed in the development to RedeemAR: A Bible Learning Application through Augmented and Virtual Reality;
2. determine the features of the RedeemAR: A Bible Learning Application through Augmented and Virtual

Reality; and

3. measure the level usability of the RedeemAR: A Bible Learning Application through Augmented and Virtual Reality using USE questionnaire in terms of:

- a) usefulness;
- b) satisfaction;
- c) ease of use; and
- d) ease of learning.

### **Research Questions**

The RedeemAR: A Bible Learning Application through Augmented and Virtual Reality aims to develop a usable mobile application that will help the children who are being taught by POP Student Center to learn about the Bible. Specifically, this answers the following questions:

- 1. what are the information requirements needed in the development of RedeemAR: A Bible Learning Application through Augmented and Virtual Reality;
- 2. what are the features of the RedeemAR: A Bible Learning Application through Augmented and Virtual Reality; and
- 3. what is the level of usability of the RedeemAR: A Bible Learning Application through Augmented and Virtual Reality using USE questionnaire in terms of:
  - a) usefulness;
  - b) satisfaction;
  - c) ease of use; and

d) ease of learning?

### **Scope and Delimitation**

Researchers conducted this study from the 2nd semester of the 2022-2023 academic year to the 1st semester of the 2023-2024 academic year. The focus of this study is to develop an offline virtual reality (VR) Bible learning mobile application to provide a digital tool for teaching salvation stories to children aged six to twelve years old from Mercedes, Camarines Norte who are being taught by the POP Student Center. The application features three salvation stories: Creation of the Physical and Spiritual World, Adam and Eve Sinned, and Cain and Abel, presented using virtual reality technology to enhance the learning experience. In story mode, stories are accessible via cards by using the mobile phones' cameras, using the augmented reality feature. There is a quiz mode, with each question having multiple choice answers, to evaluate the children's learning.

This research has certain limitations. The application is only compatible with Android phones running version 13.0 or higher and requires a built-in gyroscope. Additionally, since the application uses virtual reality technology, a VR headset is required during story mode. The researchers developed the application exclusively for evaluation and testing purposes, and it will not be implemented due to time constraints. Lastly, the story limits to watch only

in AR mode and the stories should be finished playing to use the app again.

### **Significance of the Study**

The RedeemAR: A Bible Learning Application through Augmented and Virtual Reality study aims to develop a mobile virtual reality (VR) Bible learning application. This study has the potential to have a significant impact on a variety of groups, including students, missionaries, parents, educators, and future researchers.

Students. The interactive and immersive AR experience RedeemAR offers can enhance students' understanding and retention of salvation stories.

Missionaries. This app can be used to enhance missionary teachings, making them more engaging and effective for children, which could increase the impact of missionary work.

Parents. Parents can use this app to teach their kids Biblical stories conveniently and cost-effectively.

Educators. The application can serve as a case study for educators who are interested in using VR technology into their teachings. The study can provide insights into the effectiveness of using AR technology in education.

Future Researchers. The application can serve as a source of inspiration for future researchers who are interested in developing educational applications using AR technology.



## **Chapter 2**

### **REVIEW OF RELATED LITERATURE AND STUDIES**

This chapter showcases an expansive array of literary sources and scholarly works that pertain to the present study. Drawing upon the insights of esteemed authors in the fields of Augmented Reality and Biblical schooling, multiple excerpts have been included to facilitate a rigorous investigation of topics both directly and indirectly connected to the research endeavor, which focuses on the development of a "RedeemAR: A Bible Learning Application through Augmented and Virtual Reality."

#### **Information Requirements Needed in the Development of Augmented Reality Application for Biblical Stories**

The introduction of Bible stories to children at an early age and their continued learning is of paramount importance as it provides a solid foundation for their faith and lives. It is inherent in human nature to seek a Divine Power, and through the teaching of the Bible, one can encounter the true God and behold the love of God expressed in the characters of Ruth, the passion of Peter, the gift of Jesus, and the examples from Genesis to Revelation. To instill respect for the Bible as the ultimate authority in their lives, children are encouraged by the church to learn about it. However, Sutopo et al. (2019) suggests that merely listening to Bible lectures is not sufficient for the acquisition of faith; children

should discover the truth for themselves. Nevertheless, the traditional classroom learning process, which employs books as the primary medium and has recently been supplemented by video presentations, may not suit the learning styles of children in the current IT era, who find smartphones and other digital media more appealing than books.

Moreover, the effective teaching of the Bible remains a challenge for many missionaries who encounter difficulties in generating interest in the religious text. Thus, this underscores the need for innovative approaches to biblical education. The concept of innovation, as per convention, pertains to the introduction of a fresh idea or technique. According to Kylliäinen (2019), it is evident that the absence of innovation results in a lack of originality, and consequently, the absence of progress. Applied to biblical education, innovation represents a multifaceted strategy to improve the efficacy of biblical instruction by introducing new pedagogical tools, enhancing existing instructional resources, and deploying novel features to supplement traditional teaching methods. Consequently, innovation in biblical education constitutes a critical element in promoting effective and engaging biblical learning experiences.

Further, the realm of bible teaching has undergone a significant transformation with the advent of digital Bibles. The inception of Bible programming experimentation

can be traced back to the 1950s and 1960s. After this is the development of interactive Bible learning mobile applications, as per Dyer (2023).

Furthermore, Augmented Reality (AR) represents a viable means of facilitating multi-sensory learning in students, as it offers an interactive technology platform that superimposes digital features onto the real world. The distinctive attributes of AR render it highly compatible with educational contexts. Through the integration of digital resources into the classroom, AR enables students to interact with and immerse themselves in the learning process. The conventional confines of traditional learning, such as reading and writing on worksheets, are transcended, and students can now access topic-specific learning materials in the palm of their hands. These affordances position AR as a highly beneficial educational tool with diverse potentialities, in line with the findings of Avantis (2022). This technology is adaptable to both mobile and non-mobile devices. Historically, AR's technological progress has primarily focused on the development of smartphone and tablet applications. In educational settings, AR has demonstrated utility in promoting student motivation, enhancing visualizations, and enabling simulations as per Bacca et al. (2014) and Radu (2014).

In another study by Huotari & Ikonen, (2017) augmented reality (AR) technology can provide an effective solution

for designing authentic and motivating learning environments in religious education. This technology facilitates the development of vital competencies and skills required in the 21st century and supports a diverse range of learners by enabling the utilization of the entire body and multiple senses in the learning process. AR can enhance the visitor experience by making symbols, art, and customs within a sacred space visible. Moreover, in environments where physical access is restricted, such as churches, AR can add value through gamification of learning and increasing motivation. However, it is essential to consider the objectives when developing the environment, as certain objectives, such as exploring silence, the sacred, or one's relationship with the church building, may be better achieved without the use of AR.

In addition, despite the perceived advantages of implementing Augmented Reality (AR) in applications, developers encounter significant problems, particularly with registration and sensing. The registration problem is one of the fundamental issues that currently hinder AR applications. Proper alignment of objects in the real and virtual worlds is necessary for creating an illusion that the two coexist. However, accurate registration is critical in many applications, such as in the case of a needle biopsy where the virtual object must be in the same location as the real tumor for a successful biopsy. Without accurate

registration, AR is unlikely to be accepted in various applications. Sensing problems are also a challenge since accurate registration and positioning of virtual objects necessitate precise tracking of the user's head and sensing the locations of other objects in the environment. The most significant obstacle in building effective AR systems is the need for accurate, long-range sensors and trackers that can report the user's location and surrounding objects in the environment (Azuma, 1997).

The study aims to help to improve the learning performance of children in learning the Bible's salvation stories using a mobile application. According to Pambayun et al. (2019), the impact of smartphones on people's lives has been significant, with various applications making life more convenient. In Indonesia, many teenagers are familiar with smartphone technology and its potential for education. To assist high school students in learning simple harmonic motion, mobile learning apps were developed and tested on 34 students. Results show a moderate gain in student learning achievements.

In light of the challenges associated with integrating virtual and augmented reality worlds into educational settings, Papanastasiou et al. (2019). The findings of the study suggest that virtual and augmented reality applications can effectively enhance learning and memory by creating immersive, multimodal environments that

incorporate multiple sensory features. Through haptic audio-visual skills, users can interact with virtual and augmented environments to improve learning, social, and creative skills. Furthermore, the study examines the implications of the growing commercial interest in this trend, particularly in high-tech education.

In the context of the current study, the development of the application will be executed through the utilization of the Unity platform. This approach is akin to the methodology employed by (Mustafina et al., 2020) in the creation of an augmented reality mobile application, which involved the development of an animated game character.

The significance of Mustafina et al.'s study within the context of this research extends notably to its invaluable role in aiding the identification of the most suitable and effective platform for mobile application development. Moreover, the collective body of work by Azuma, Avantis, Baca et al., Papanastasiou et al., and Radu has played a pivotal role in shaping the research landscape by shedding light on one of the most effective methods for teaching children through the medium of mobile phones: augmented and virtual reality. On a parallel note, insights obtained from Huotari and Ikonen, Dyer, Sutopo et al., and Kylliäinen's studies have served as indispensable guideposts for the researchers in acquiring the necessary information requirements for the effective teaching of

Biblical stories to children.

### **Features of the Augmented Reality Application for Biblical Stories**

Mobile application games help to improve the learning of dyslexic children. LaroLexia was developed, and it showed a significant improvement in reading skills, suggesting that the mobile game can serve as a valuable learning tool for dyslexic children and aid in managing their reading disability as per Bigueras et al. (2020). In alignment with this study, a mobile application is an effective way to help children improve their learning. Similar to the study, the researchers implemented eye-catching user interface to help the children engage in the learning app.

According to Chi et al. (2013), the developments in AR applications for AEC/FM focus on four technologies that could impact the growth of AR applications. These technologies are localization, NUI, cloud computing, and mobile devices. AR can be deployed in intricate environments with advancements in localization technology. Implementing augmented reality (AR) in the mobile application will have an impact on the growth of AR in this project.

Moreover, augmented reality (AR) has the potential in transforming K-12 and higher education by providing access to information and resources through technology-enabled

devices. AR can reduce cognitive load and enhance cognitive thinking processes, which is useful in the medical industry for patients to regain cognition and mobility in reference to Kairu (2021). AR is a useful application in storytelling as it provides a visual representation of the story, and users can freely interact with the mobile application.

In addition, the researchers planned to use the Unity 3D game engine in the development of this mobile learning application. There is a study of using Unity 3D where the "Calory Battle" AR game was created in two versions, with the second utilizing the Unity 3D game engine. A mixed-method usability evaluation of the two versions on children and university students showed that interaction with AR content and user interface clarity was improved in the Unity 3D version. The study provides three main contributions: the creation of a novel mobile AR exergame to motivate physical activity, the reimplementation of the game using the Unity 3D game engine, and the results of a usability evaluation comparing the two game versions as stated by Kim et al. (2014).

Additionally, Fauzi et al. (2021) stated that using interactive mobile applications improves learning, motivation, engagement, and participation among students. This study introduces a gamified e-quiz mobile application, Kingdom Quizzes (KQ), to enhance students' motivation and retention in academic tasks, meeting the expectations of



the current generation of learners. KQ comprises two modules, a quiz and a game module, where students receive rewards, such as coins or life items, based on their performance in the quiz module, creating a sense of motivation and intention to continue using the product. Overall, KQ is an effective tool for promoting active, multisensory, and experimental learning among students.

Another study by Allal-Chérif (2022), immersive technologies, notably AR, VR, and AI, have the potential to safeguard cathedrals and enable remote access for visitors. This allows individuals to explore the inaccessible from their homes, fulfilling desires that may include the unattainable or the restricted. The outcome is a profound spiritual encounter, with the virtual realm perceived as being equally potent, if not more so, than the physical reality.

Moreover, Hu-Au and Lee (2018) found that VR can improve student learning outcomes in a variety of subjects, including science, mathematics, and history. The study also found that VR can increase student motivation and engagement.

In addition, the study by McGovern et al. (2023), suggests that VR technology can be an effective tool for enhancing presentation skills in business education. VR provides students with an immersive and engaging learning experience that allows them to practice their skills in a

safe and supportive environment.

The significance of Bigueras et al. and Fauzi's studies in the context of this study is the development of a mobile application with interface that are suitable for its target users. Moreover, Chi et al, Kairu, and Kim et al.'s study helped the researchers to determine that AR is needed to implement in the mobile learning application. In connection, Allal-Chérif's study in relation with Hu-Au and Lee, and McGovern et al.'s study helped the researchers to implement VR in the Bible learning mobile application.

#### **Level of usability of the Augmented Reality Application for Biblical Stories**

To evaluate the usability of RedeemAR: A Bible Learning Application through Augmented and Virtual Reality in terms of usefulness, satisfaction, ease of use, and ease of learning, researchers conducted an in-depth analysis of existing literature about the usage of AR technology in the realm of education. The primary objective was to comprehensively assess the extent to which AR has been utilized to facilitate and enhance learning outcomes, particularly in bridging the gaps between knowledge acquisition and retention among students.

Perceived responsiveness and content were crucial determinants of user satisfaction. Aligned with the study being conducted by the researchers, the mobile application that will be developed aims to provide users with

satisfaction while learning, as per Liu et al. (2018).

Moreover, VR technologies generally exert a positive influence on educational outcomes. The meta-analysis revealed that VR can enhance knowledge acquisition, skill development, and the retention of learning effects. However, VR have mixed effects on anxiety, cognition, creativity, and gender differences. Additionally, the study found that VR's impact on learning attitudes, learner satisfaction, and engagement were not consistently positive across all studies according to Yu, (2021).

In another study by Akçayır and Akçayır (2017), AR offers unique advantages in combining virtual and real objects in a real setting, but pedagogical and technical issues must be considered. These challenges, such as the need for more class time and adequate technology experience, should not prohibit the use of AR. The authors anticipate that technical problems will be resolved with new developments in the future. However, hardware requirements and an internet connection are prerequisites for using AR applications in education.

Additionally, Bower et al. (2014) stated that the efficiency and effectiveness of AR in education and training have been demonstrated across various domains of the K-12 and higher education curricula. Studies conducted in subjects such as mathematics, geometry, physics, biology, chemistry, astronomy, history, geography,

engineering, robotics, and other academic areas have shown that AR provides students with attractive, stimulating, and exciting experiences. Hence Furió et al. (2013); Lee (2012); Muschio et al. (2015); Potkonjak et al. (2016); and Radu (2012) all supported that AR has been recognized as a powerful tool for enhancing learning outcomes, as it allows students to interact with virtual objects and simulations, providing them with a more immersive and engaging learning experience.

Zhu et al. (2015) stated that it is important to have a plan when designing AR learning activities. This plan should take into account what the learners are supposed to learn and what their individual needs are. Using AR technology in medical education can help learners apply what they have learned in real-world situations.

Similarly, AR is a powerful technology with the potential to revolutionize education. However, it is important to use AR in a way that promotes critical thinking and creative thinking, not just lower-order thinking skills. Educators need to prepare for the future of AR in education, which will include classroom overlays for teachers and interactive learning experiences for students, Bower et al., (2014).

The findings of the studies above provided further support for the integration of AR into the educational setting, emphasizing its potential to promote deeper

learning and foster the development of crucial skills necessary for success in both academic and professional contexts.

### **Synthesis of the Art**

Developing a Bible learning app incorporating augmented reality (AR) has been suggested as an effective method to improve the retention of information and comprehension of Bible stories, particularly for younger generations. A series of literature reviews were conducted by researchers to identify relevant academic articles, reports, and books on the use of AR in education, as well as research on teaching Bible stories. The literature review revealed several trends, including the potential of AR to enhance student engagement and motivation and provide immersive and interactive learning experiences. AR technology can enable students to visualize and explore Biblical settings, characters, and events in new and engaging ways to actively participate in the learning process.

Zoller et al. (2018) examined the effectiveness of an AR app in teaching Bible stories to elementary school students, which significantly increased student engagement and motivation, as well as their understanding of the stories. Similarly, Park et al. (2019) found that AR increased student motivation and interest in learning Bible stories among Korean middle school students. Various

studies have also demonstrated the effectiveness of AR in teaching subjects, including science, history, and language learning. The research by Kamarainen et al. (2013) found out that utilizing AR in a science class led to significant gains in student motivation and learning outcomes compared to traditional instruction. Likewise, Lu et al. (2019) discovered that Augmented Reality as a means to teach Chinese history improved student engagement and learning outcomes.

Moreover, in a recent study, Dilmen and Atalay (2021) found that the usage of AR in lessons had a positive effect. Specifically, AR technology improved their ability to innovate, think critically, communicate, and collaborate in various learning contexts. These findings highlight the potential of AR technology as a tool for enhancing their skills and preparing them for the demands of the 21st-century workforce.

However, there is a relatively limited amount of research specifically on the use of AR in teaching Bible stories, and more research is needed to understand the specific ways in which AR can enhance learning outcomes for Bible stories and identify the most effective types of AR applications and content for this purpose. Based on the synthesis of the literature, the current state-of-the-art on the effectiveness of using AR in teaching Bible stories suggests that this technology has the potential to enhance

student engagement and motivation and provide immersive and multi-sensory learning experiences. Further research is needed for a better understanding of the most effective ways to use AR in this context and assess its impact on learning outcomes.

Both the research on AR in education and the research on AR in teaching Bible stories suggest that AR can be an effective way to enhance student engagement and motivation. AR technology can provide students with immersive and interactive learning experiences that allow them to visualize and explore complex concepts in new and engaging ways.

One key difference between the two areas of research is the level of specificity. The research on AR in education is broader and encompasses a wide range of subjects, while the research on AR in teaching Bible stories is more focused on a single subject. Additionally, there is a relatively limited amount of research specifically on the use of AR in teaching Bible stories, compared to the research on AR in education overall.

Despite the differences in the research, both areas suggest that AR has the potential to be a valuable tool for enhancing student learning. Further research is needed to better understand the specific ways in which AR can be used to teach Bible stories and other subjects effectively, and to design AR-based learning resources and pedagogies.

## **Chapter 3**

### **RESEARCH METHODOLOGY**

This chapter presents information about the research methodology utilized by the researchers in their study titled "RedeemAR: A Bible Learning Application through Augmented and Virtual Reality." The chapter discusses the software development methodology, schedule of activities, sources of data, the population of the study, data collection method, data analysis, and ethical considerations in the development of the study.

#### **Software Development Methodology**

This section discussed the Software Development Methodology used to develop and build an augmented reality Bible study application for the six-twelve years old students of POP Student Center.

To oversee the project management of the suggested learning application, the researchers utilized the Rational Unified Process (RUP) model.

The Rational Unified Process (RUP) is a widely adopted iterative and incremental framework in software development, focusing on communication, collaboration, and risk management. It aims to deliver high-quality software that meets user needs within set budgets and timelines. RUP provides structured task allocation and guidelines for development teams to enhance efficiency, according to Kruchten, (1999) as shown in Figure 1.



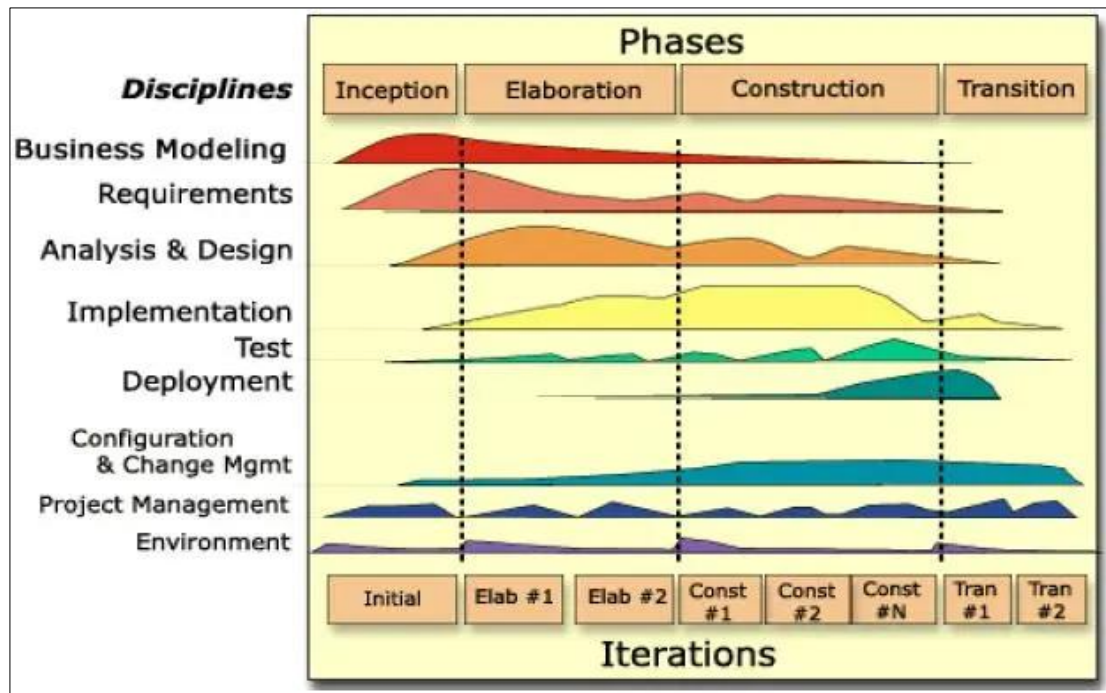


Figure 1. The Rational Unified Process Model

The researchers decided to employ the RUP model due to its focus on use cases and its comprehensive methodology, which placed significant importance on precise documentation—a crucial requirement for this study. Furthermore, RUP proved beneficial in reducing unforeseen development expenses and minimizing resource wastage, which is highly advantageous during the development process of the proposed application. More importantly, given the complex requirement of the learning application, the researchers need the iterative nature of RUP to allow the repetition of phases until they achieve the desired outcome.

According to Kruchten (1999), RUP encompasses four key phases: Inception, Elaboration, Construction, and Transition.

The Inception phase is focused on understanding the business needs of the project and developing a high-level plan for the project. During this phase, the project scope is defined, the risks are identified, and a business case is developed.

During the Inception phase, the researchers focused on key tasks: secured stakeholder agreement on goals, obtained funds, and drafted a basic project plan, potentially including a user interface prototype. They established a suitable work environment, developed a general project progression plan, and clarified the project's purpose. This involved outlining success measures, identifying potential issues, estimating resource needs, and setting a timeline with key milestones.

The Elaboration phase, the second phase of RUP, holds significant importance within its four stages, the researchers focused on understanding project requirements and architecture, tackling challenges, and mitigating risks. They conducted in-depth interviews with clients, reviewed related studies, gathered information from similar applications, and designed a low-fidelity prototype. Additionally, they collaborated on design and programming language choices for the proposed Bible learning application.

The Construction phase represents the third stage of the RUP. This phase entails the researchers' preparedness

to produce and integrate each component and feature into the final project. The researchers worked on coding, integrating components, and building the entire system of the RedeemAR VR-powered learning application. Responsibilities include coding, graphic creation, and research paper writing. The application features story mode with augmented reality for an immersive experience, a quiz mode for learning evaluation, and a character selection option.

Finally, the Transition phase represents the final stage in the entire product development life cycle, marking the transition from the development phase to the production phase. This phase involves software testing, rectifying defects, and releasing the software. During this phase, the researchers gathered feedback and input from the users by facilitating client testing, then used them to make necessary updates or modifications to the application. After completing the system review and testing, the researchers deployed the developed Bible learning application to its intended users.

### **Schedule of Activities**

In the study, the utilization of a Gantt chart was employed by the researchers to effectively demonstrate the sequencing of activities and monitor the overall progress of the project. The designated letters, ranging from A to D, corresponded to the specific activities performed during

each week of the month. Additionally, the shaded sections within the chart depicted the dedicated time frames allocated for the completion of individual tasks.

The initial task depicted in Figure 2 of the Gantt chart was denoted as "Project Inception" and encompassed activities such as conceptualization and data acquisition essential to the project. During this stage, the researchers dedicated their efforts to establishing the fundamental framework for the Capstone Project. Spanning from the first to the last week of January, this phase primarily involved group brainstorming, extensive literature review, and thorough exploration of existing analogous applications that could contribute to the development of the proposed Bible learning application.

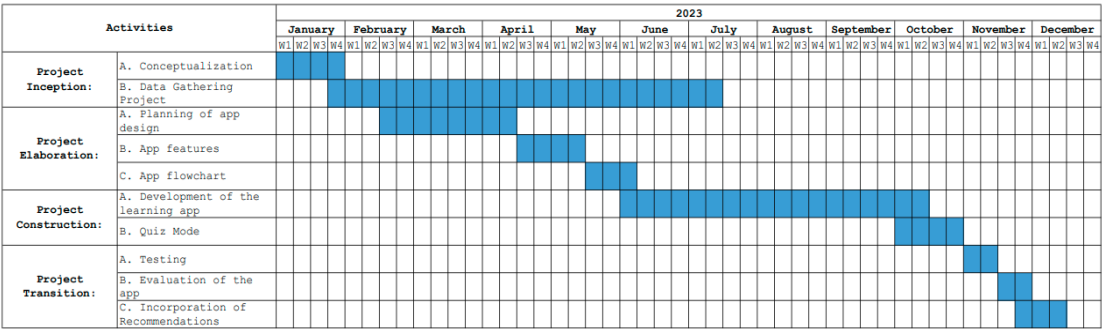


Figure 2. Schedule of Activities

Following the initial phase, the subsequent activity, labelled as "Project Elaboration," involved meticulous planning of the learning application's features, design, and flow. During this stage, comprehensive attention was given to the creation of a user-friendly interface (UI) as well as the game's assets. This activity spanned from the

third week of February to the first week of June, encompassing an extensive duration to ensure thorough attention to detail and comprehensive development.

The Gantt chart's third activity was identified as "Project Construction," during which the researchers dedicated their efforts to the development of the actual learning application itself, alongside the quiz mode feature of the app. Simultaneously, the team collected pertinent information necessary for the project's advancement. The software development phase spanned from the first week of June to the last week of October, allowing for a substantial timeframe to ensure meticulous design, implementation, and refinement.

The final activity, known as "Project Transition," encompassed crucial steps such as software testing, evaluation, and the integration of recommendations. The researchers placed particular emphasis on conducting testing and evaluation through survey questionnaires administered to selected respondents, specifically aimed at addressing research question number 3. Additionally, this phase included the final oral examination conducted by the researchers. Subsequently, the team proceeded to incorporate the recommendations provided by the panel of experts. The entirety of the project transition phase took place from the first week of November to the second week of December, ensuring a focused and efficient process of

implementing necessary adjustments and finalizing the project.

### **Sources of Data**

This study entitled "RedeemAR: A Bible Learning Application through Augmented and Virtual Reality" used primary and secondary sources of data wherein:

Primary Data. These data are consisted of the interview with the client, and the evaluation from chosen respondents; and

Secondary Data. These data were acquired from the online papers and journals from Google Scholar, the Eric Library, ResearchGate, ScienceDirect, Youtube, online forums blogs, and other websites were used as references for this study.

### **Population of the Study**

A population refers to a specific group of individuals from which a representative sample is selected for a study. Consequently, any assemblage of people who possess a common characteristic can be identified as a population (Momoh, 2023). In this study, the population consisted of fifteen (15) children aged between six to twelve years old, from Barangay Gaboc, Mercedes, Camarines Norte.

In this study, the researchers employed purposive sampling to select the respondents. The method of sampling is suitable for this study because, according to a study, purposive sampling enables researchers to gather valuable

information from samples by leveraging their knowledge, judgment, and intellect. Despite its limitations, it remains an essential solution when crucial units cannot be overlooked according to Rai & Thapa (2015).

#### **Data Collection Method**

In the data gathering process for this study, the researchers conducted interviews, sought out studies and literature that are similar and related to "RedeemAR: A Bible Learning Application through Augmented and Virtual Reality." Additionally, the researchers administered survey questionnaires to evaluate the proposed mobile application.

To answer the first statement of the problem, the researchers employed various methods to collect all the necessary information required for the development of the RedeemAR mobile application. The researchers conducted interviews with the client, posing numerous questions to gain a clearer understanding of the client's preferences and project requirements. This approach facilitated a deeper comprehension of the project's demands. Additionally, the researchers conducted online searches for articles and studies related to the subject matter. This allowed the researchers to discover valuable ideas, concepts, and approaches that could be applied to their own project.

To answer the second statement of the problem, the

researchers utilized the information gathered from related applications and articles to inform the development of RedeemAR's features. By examining and studying these resources, the researchers gained valuable insights that informed the design and implementation of the application's functionalities.

To address the third statement of the problem, the researchers assessed the usability of the proposed mobile application by conducting a survey using the USE tool. To assess the usability of the RedeemAR application, the researchers printed an evaluation form and distributed it to the respondents who had used the RedeemAR application. After the respondents completed the evaluation form, a rating scale was employed to measure the level of usability of the application. This approach allowed the researchers to gather quantitative data on user satisfaction and the effectiveness of the RedeemAR application.

### **Data Analysis**

Evaluation of the RedeemAR application's usability was conducted by the researchers using survey questionnaires. The assessment involved students children aged six to twelve who are being taught by the POP Student Center.

For data analysis and interpretation, researchers used the Likert Scale, created by Rensis Likert in 1932. This widely used tool employs a 5-point scale for measuring attitudes and opinions. Respondents indicate their



agreement or disagreement with statements, providing quantitative data for statistical analysis. However, its reliability and validity depend on clear statements and careful data interpretation.

Table 1  
Five-Point Likert scale and Interval

Likert-Scale Description	Scale	Interval
Strongly Agree	5	4.21 - 5.00
Agree	4	3.41 - 4.20
Neutral	3	2.61 - 3.40
Disagree	2	1.81 - 2.60
Strongly Disagree	1	1.00 - 1.80

Table 1 presented the interpretation of the computed weighted mean, where the following ranges indicate the corresponding levels of agreement: Strongly Agree (4.21 - 5.00), Agree (3.41 - 4.20), Neutral (2.61 - 3.40), Disagree (1.81 - 2.60), and Strongly Disagree (1.00 - 1.80).

#### **Statistical Treatment of Data**

The researchers analyzed the collected data using the weighted mean for determining the average value of the provided data. This approach allowed for a better understanding and interpretation of the data, specifically regarding the respondents' perception of the effectiveness and performance of the developed Augmented Reality Mobile Application. The formula for calculating the mean is as follows:

$$\bar{x} = \frac{\Sigma(WX)}{N}$$

where:

$\bar{x}$  = weighted mean

$\Sigma$  = symbol of summation

$W$  = weight

$X$  = marks

$N$  = total number of respondents

### **Ethical Consideration**

The researchers prioritizes ethical considerations in developing the Bible learning application and gathering data for this study. They obtained informed consent, respected participants' autonomy and offered the freedom to withdraw, and upheld the participant's privacy and confidentiality through secure data storage and anonymization. More significantly, researchers avoided any form of discrimination and harm based on beliefs, promoting inclusivity and safety.

The researchers maintained transparency and integrity in reporting findings without data manipulation, and ethical guidelines and institutional requirements were adhered to with proper approval. Similarly, the researchers engaged in dialogue, addressed concerns, and valued diverse perspectives. The researchers gathered all data responsibly, prioritizing participant well-being and contributing to knowledge with integrity.

## **Chapter 4**

### **RESULTS AND DISCUSSIONS**

This chapter contains detailed presentation and discussion of analysis and the results of this study. The presentation also discussed in the light of the previous statement of the problems: 1) What are the information requirements needed in the development to RedeemAR: A Bible Learning Application through Augmented Reality; 2) What are the features of the RedeemAR: A Bible Learning Application through Augmented Reality; and 3) Measure the level usability of the RedeemAR: A Bible Learning Application through Augmented Reality using USE questionnaire in terms of: Usefulness, User satisfaction, Ease of use and Ease of learning.

#### **Information Requirements needed in the development to RedeemAR: A Bible Learning Application through Augmented Reality**

In addressing the first research question of this study pertaining to the information requirements for the development of the Bible Learning Application via Augmented Reality, the researchers identified imperative data parameters. Moreover, the following information requirements have been structured with the understanding that the application does not grant users the ability to create personal accounts. Furthermore, its offline availability implies the absence of a scoreboard displaying

the scores of other participants in the game.

Bible Stories. The primary requirement for the development of RedeemAR was the acquisition of salvation stories from the Bible, as provided by the POP Student Center. These stories are essential as they serve as foundational references for crafting the environment in the Story Mode. Additionally, they played a crucial role in formulating and picking the final questions for the Quiz Mode. A total of three chapters were accumulated, including: Aralin 1: Ang Paglikha ng Pisikal at Espiritual na Daigdig; Aralin 2: Si Adan at Si Eva; Aralin 3: Cain at Abel. The inclusion of these chapters ensures a comprehensive understanding of salvation narratives, enhancing the educational and interactive experience of the application.

Learning Materials. Subsequent to the primary information requirement, the study also required a crucial dataset, specifically the quiz questions sourced from the POP Student Center. Each of these questions presented four potential answers, with just one being accurate. Correspondingly, every lesson, from Aralin 1 through Aralin 3, mandated an exact set of fifteen questions, each directly related to the content covered in the Story Mode. These questions, central to the Quiz Mode, aimed to evaluate users' comprehension and retention of the salvation stories, thus enhancing the educational

effectiveness of the application.

Biblical Elements. The researchers sought photographic references of biblical characters, including Adam, Eve, Cain, and Abel. Attention was also given to settings such as the Void, Newly Created World, Garden of Eden, and Presence of God. This approach ensured a close match to the descriptions provided by the POP Student Center.

Related Articles and Studies. The researchers needed to add related articles and studies to support everything stated in the technical document. Google Scholar, the Eric Library, ResearchGate, ScienceDirect, blogs, and other websites were used as references for this study.

Game Assets. To develop the RedeemAR application, the researchers utilized game assets for the user interface and 3D objects for the software employed in the application's development. Adobe Illustrator and Adobe Photoshop were utilized for creating the user interface, with additional UI assets sourced from FreePik. 3ds Max and Blender served as the software for editing 3D objects, while 3D assets were downloaded from Unity Store, Sketchfab, and Mixamo websites.

Development of the Application. During the development of the RedeemAR Application, the researchers used Unity Hub, a popular software for developing mobile applications. The researchers did coding for the functions needed in the

game, for guidance, the researchers watched YouTube videos, visited online forums for programmers mainly StackOverflow in order to solve bugs and errors. Vuforia Engine is a plugin for unity that is also used for implementing AR.

### **Features of RedeemAR: A Bible Learning Application through Augmented Reality**

In addressing the second research question of this study about the features of RedeemAR, the researchers asked the client about the ideal app they wanted to have and consider the recommendations of panels during the title defense. Acquiring the information from the client and panels, the researchers found ways to implement the features needed to make the app.

Fascinating AR Camera. Enables users to scan the cards associated with their preferred story using their mobile phone's camera. Once the card is scanned, the game seamlessly transitions to the corresponding story, offering users the freedom to watch and engage, shown in Figure 3.

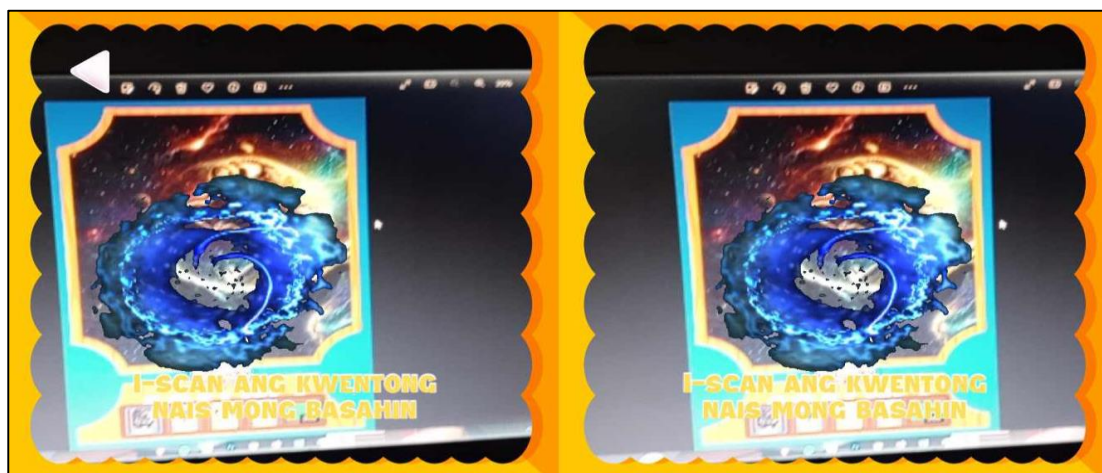


Figure 3. Fascinating AR Camera

Captivating AR-ready Cards. S Figure 4, each of the three distinct cards is visually represented, correlating with the three separate stories available in the mobile application. These cards, when scanned by the augmented reality camera, activate the immersive storytelling experience, bringing each unique narrative to life within the app's interactive and engaging environment. This innovative approach seamlessly blends physical and digital storytelling mediums, enhancing user engagement and interaction.



Figure 4. Captivating AR-ready Cards

Eye-catching VR Experience. This feature provide users with a captivating and interactive experience. By utilizing 3D display, realistic sounds and music, and gyroscope to immerse users in a virtual environment, as illustrated in Figure 5, enhances the interactive nature of the experience by tracking their movements and orientation, ensuring a

seamless and engaging virtual reality encounter.

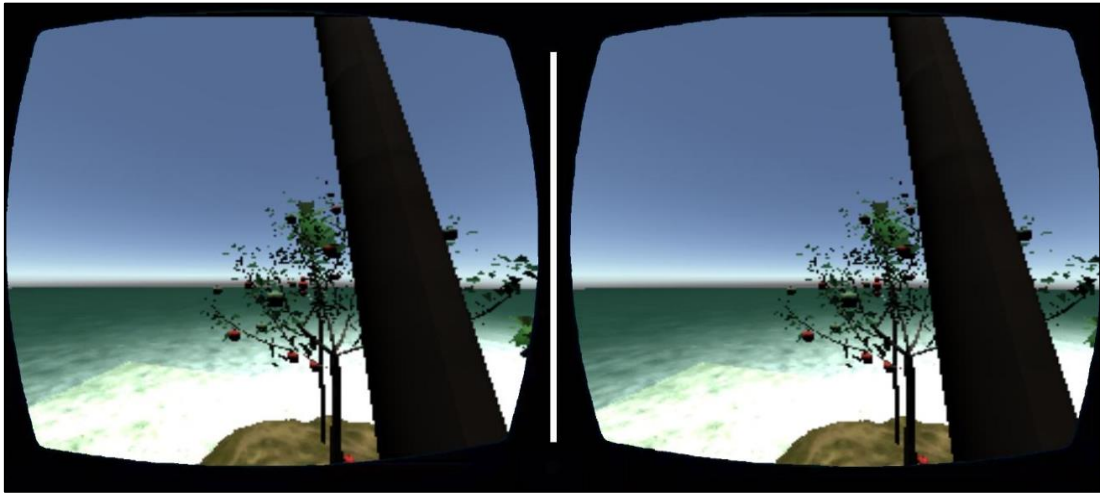


Figure 5. Engaging VR Experience

Interactive Character Selection. Users are introduced to a visual showcase, where all three characters are thoughtfully displayed. This visual gallery not only adds an element of visual delight but also facilitates an informed decision-making process. Users can effortlessly scroll through the character options, enabling them to have a comprehensive and detailed look at each character, including their appearance, as shown in Figure 6.



Figure 6. Interactive Character Selection



Interactive Quiz Selection. This feature allows the user to choose a quiz that they wanted or need to take in order to evaluate their knowledge after watching the story mode. By enabling users to make an informed decision about which lesson to undertake, the feature acknowledges and respects their individual interests and objectives. It also encourages users to take ownership of their learning journey, fostering a sense of engagement and investment in the educational process as shown in Figure 7.

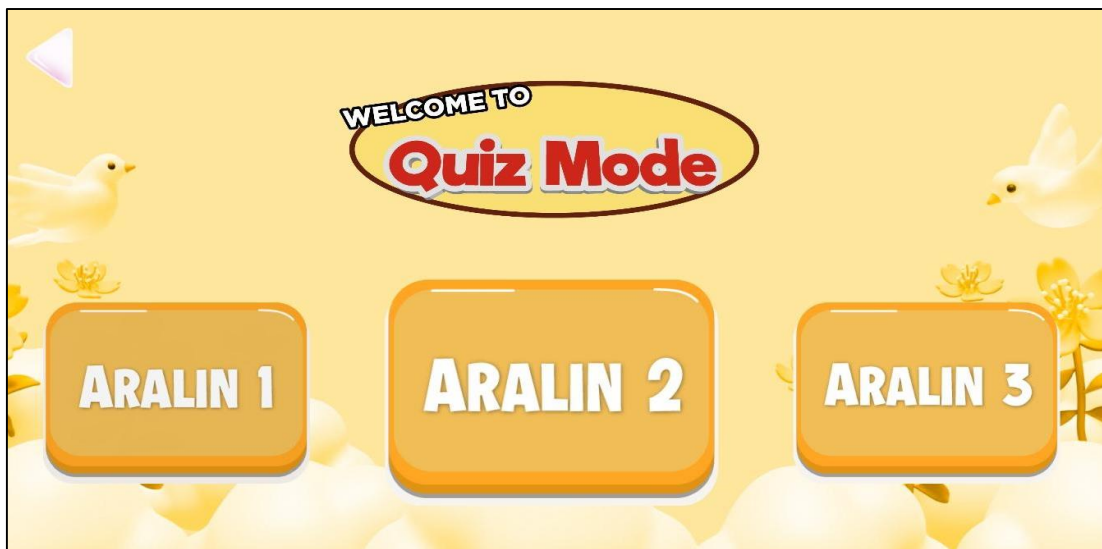


Figure 7. Interactive Quiz Selection

Dynamic Multiple Choice Quiz Mode. This feature gives the user questions about the users' chosen lesson with multiple choices, the questions and choices are randomized to add more thrill in the game. The application has an indicator whether the answer is correct or reveal the correct if the chosen answer is wrong, as shown in Figure 8. The quiz should be used to test the knowledge of the user before and after they finish the story mode.

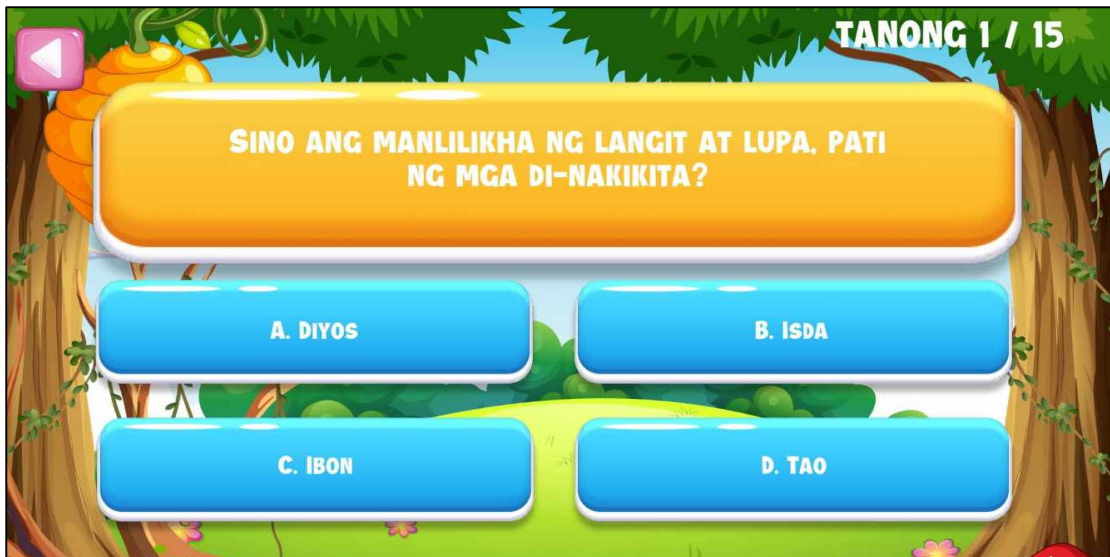


Figure 8. Dynamic Multiple Choice Quiz Mode

Gratifying Score Display. This feature shows the result of the quiz to help the evaluation of knowledge of the user. This will show the user how well they performed on the test. There are ranges of score where different badges show accordingly, from a perfect score through zero. This feature will encourage the children to study more in order to get the better badge than the first one they had, shown in Figure 9.

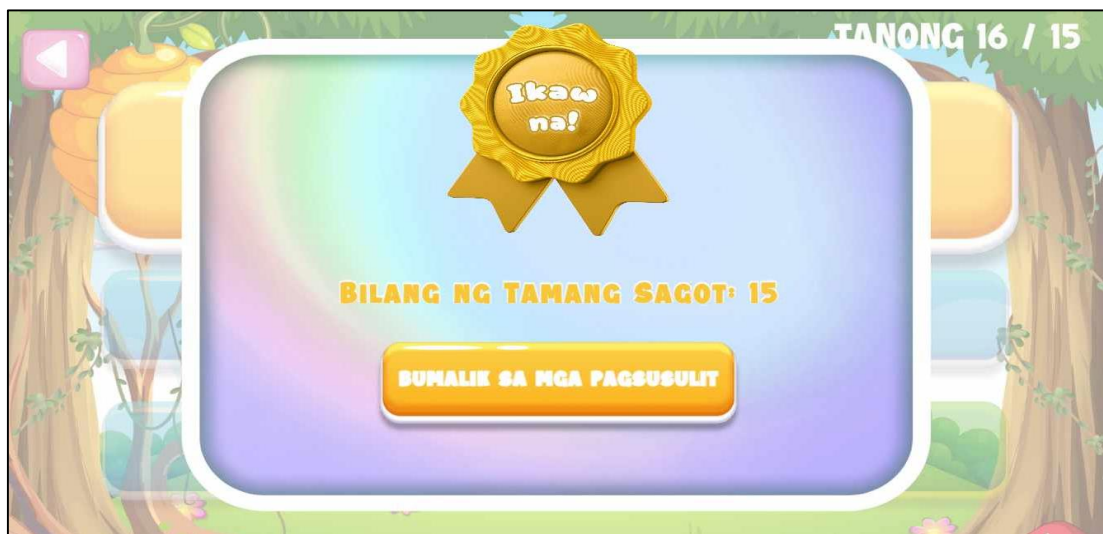


Figure 9. Gratifying Score Display

### **Level of Usability in terms of Usefulness, Satisfaction, Ease of Use, and Ease of Learning**

The evaluation of user feedback played a pivotal role in addressing the third research question, which focused on gauging the effectiveness of the application. This assessment was meticulously conducted through detailed survey questionnaires, which were distributed to respondents who had firsthand experience with the application. The survey was meticulously designed to cover a range of critical factors including usefulness, user satisfaction, ease of use, and ease of learning. These specific terms were carefully chosen as they are fundamental in assessing the overall usability of the system.

Table 2, highlighting the Level of Usefulness of the proposed system, reveals a strong consensus among respondents on its utility, evidenced by an impressive average rating of 4.80. The highest indicators are for its practicality and meeting expectations, encapsulated in the statements "It is useful" and "It does everything I would expect it to do," both rated at 5. However, areas perceived as less impactful include effectiveness and productivity, as indicated by lower ratings in "It helps me to be more effective" and "It helps me to be more productive." The pooled mean for the level of usability in terms of usefulness indicates that RedeemAR is useful.

Table 2  
Level of Usability in terms of Usefulness

Indicators		Weighted Mean	Interpretation
1.	It helps me to be more effective.	4.47	Strongly Agree
2.	It helps me to be more productive.	4.47	Strongly Agree
3.	It is useful.	5.00	Strongly Agree
4.	It gives me more control over the activities in my life.	4.73	Strongly Agree
5.	It makes the things I want to accomplish easier.	4.93	Strongly Agree
6.	It saves me time when I use it.	4.93	Strongly Agree
7.	It meets my needs.	4.87	Strongly Agree
8.	It does everything I would expect it to do.	5.00	Strongly Agree
Pooled Weighted Mean		4.80	Strongly Agree

Shown in table 3 is the level of Usability in terms of Ease of Use. The indicator that has the highest individual rating of 5 is "It is easy to use." and "Using it is effortless." Respondents believed that the developed applications are user-friendly, and it can be easy to use and understood by every user. Therefore, the respondents believed that the RedeemAR application's user interface and

user experience were clear enough to be comprehended through the buttons and texts.

Table 3  
Level of Usability in terms of Ease of Use

Indicators	Weighted Mean	Interpretation
1. It is easy to use.	5.00	Strongly Agree
2. It is simple to use.	4.67	Strongly Agree
3. It is user-friendly.	4.60	Strongly Agree
4. It requires the fewest steps possible to accomplish what I want to do with it.	4.80	Strongly Agree
5. It is flexible.	4.80	Strongly Agree
6. Using it is effortless.	5.00	Strongly Agree
7. I can use it without written instructions.	4.80	Strongly Agree
8. I do not notice any inconsistency as I use it.	4.73	Strongly Agree
9. Both occasional and regular users would like it.	4.73	Strongly Agree
10. I can recover from mistakes quickly and easily.	4.60	Strongly Agree
11. I can use it successfully every time.	4.80	Strongly Agree
Pooled Weighted Mean	4.80	Strongly Agree

The Level of Usability in terms of Ease of Learning is displayed in Table 4. The indicator "It is easy to learn to use it." and "I quickly became skillful with it." has the highest individual rating of 4.933. The respondents assumed that they can effortlessly learn every function. However, the lowest individual rating of 4.87 is "I learned to use it quickly" and "I easily remember how to use it." Moreover, the weighted mean sums up with an average of 4.90 which means that respondents strongly agree that it is easy to learn and understand.

Table 4  
Level of Usability in terms of Ease of Learning

Indicators	Weighted Mean	Interpretation
1. I learned to use it quickly.	4.87	Strongly Agree
2. I easily remember how to use it.	4.87	Strongly Agree
3. It is easy to learn to use it.	4.93	Strongly Agree
4. I quickly became skillful with it.	4.93	Strongly Agree
Pooled Weighted Mean	4.90	Strongly Agree

Table 5, focusing on the Level of Usability in Terms of Satisfaction, reveals robust approval from respondents, evidenced by a high average rating of 4.79 for the proposed

system. Factors receiving the highest ratings underscore the respondents' overall satisfaction with the application, with many describing it as "wonderful." In contrast, the lowest-rated factor points to a perceived necessity among respondents, suggesting they feel a compelling need to have access to the application. This divergence in ratings highlights both the strong appeal of the application and areas where user expectations are particularly high.

Table 5  
Level of Usability in terms of Satisfaction

Indicators	Weighted Mean	Interpretation
1. I am satisfied with it.	5.00	Strongly Agree
2. I would recommend it to a friend.	4.80	Strongly Agree
3. It is fun to use.	4.87	Strongly Agree
4. It works the way I want it to work.	4.55	Strongly Agree
5. It is wonderful.	5.00	Strongly Agree
6. I feel I need to have it.	4.40	Strongly Agree
7. It is pleasant to use.	4.93	Strongly Agree
Pooled Weighted Mean	4.79	Strongly Agree

However, the indicators that has the lowest individual rating of 4.60 is "It is user-friendly" and "I can recover from mistakes quickly and easily." The respondents discovered that some of the application's features are quite challenging to use based on their experience due to subjective perceptions. The weighted mean on the table for the level of usability in terms of Ease of Use has an average of 4.80 which means respondents strongly agree that the RedeemAR application is easy to use and user-friendly.

The Level of Usability in terms of Ease of Learning is displayed in Table 5. The indicator "It is easy to learn to use it." and "I quickly became skillful with it." has the highest individual rating of 4.933. The respondents assumed that they can effortlessly learn every function. However, out of all the indicators mentioned, the one that has the lowest individual rating of 4.87 is "I learned to use it quickly" and "I easily remember how to use it." Some of the respondents believed that the software or application would not enable them in developing new capabilities while using the application. Moreover, the weighted mean on the table for the Level of Usability in terms of Ease of Learning sums up with an average of 4.90 which means that all of the respondents of the study strongly agree that it is easy to learn and understand.

Shown in Table 6 are the different weighted averages for different criteria of level of the RedeemAR



application. The Highest criterion that has the highest weighted average of 4.90 is the Ease of Learning, with majority of respondents believing that the application experience can be used as their daily commuting companion. Moreover, the criterion that has the second to the highest weighted average of 4.80 is the Level of Ease of Learning which resulted in respondents can effortlessly understand the RedeemAR application while the Level of Satisfaction received the third-highest weighted average of 4.79 that respondents were pleased with using the application. Lastly, the criterion that has the lowest weighted average of 4.78 is the Level of Ease of Use which maybe the respondents encountered some difficulty using it.

Overall, the weighted mean for all of the criteria is 4.82 which means that the respondents of the study strongly agreed on the level of usability of RedeemAR application.

Table 6  
Overall Level of Usability

	Indicators	Weighted Mean	Interpretation
1	Level of Usefulness	4.80	Strongly Agree
2	Level of Ease of Use	4.78	Strongly Agree
3	Level of Ease of Learning	4.90	Strongly Agree
4	Level of Satisfaction	4.79	Strongly Agree
Overall Weighted Mean		4.82	Strongly Agree

## **Chapter 5**

### **CONCLUSIONS AND RECOMMENDATIONS**

In this chapter, the summary of conclusions and the recommendations of the researchers are presented in relevance to the study at hand.

#### **Conclusions**

The following were the conclusions that were drawn:

1. The information requirements for RedeemAR: A Bible Learning Application through Augmented and Virtual Reality were identified to develop the mobile app.
2. The features needed of the RedeemAR application were identified and integrated to develop the usable Bible learning application.
3. The users strongly agreed that the developed mobile application was easy to use and learn, and satisfy the user, and was useful.

#### **Recommendations**

The following are recommendations that are shown as improvements suggested by the researchers that may further improve the proposed system:

1. Having small conversation or interaction with the non-playable character will make the app more exciting.
2. Adding and integrating more stories from the Bible is highly recommended to be more beneficial to the users.
3. Implementing the results of this study is strongly recommended for the end user.

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## **Appendix A**

Request Letter for Adviser

## Appendix B

### Request Letter for Client Approval

April 18, 2023

**NIÑO ROMMEL MIRANDA**  
Youth Leader  
People of Promise (POP) Student Center

Sir:

The undersigned are the proponents from Camarines Norte State College under the Bachelor of Science in Information Technology program are presently developing capstone projects to partially fulfill the course IT 121 - Capstone Project and Research 1. The objective of the course is to enhance the student's abilities in the field of information technology by providing them with opportunities to solve real-world data science projects from various domains encountered within the industry, government, non-governmental organizations, and academic institutions, among others.

In light of this, the undersigned proposed a Capstone Project entitled "POP Bible Learning Application through Augmented Reality." The project aims to develop an interactive learning application for the students of the POP Student Center, located at Magallanes Iraya St. Purok 6 Barangay Camambugan, Daet, Camarines Norte. This application utilizes augmented reality technology to enhance user engagement and understanding of the Bible.

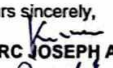
The proponents initiated the project understanding that reading lengthy paragraphs and books can be tedious for children aged six to twelve, and further recognizing that children today have different preferences for learning and engaging with information, including religious texts such as the Bible. Therefore, an interactive application can be invaluable in teaching children during their Bible studies.

Furthermore, the proponents firmly believe that the application can improve the retention of information and comprehension of Bible stories by providing users with a multisensory learning experience increasing their interest in learning, especially among the younger generation, who may be more likely to engage with technology-based learning tools.

In line with this, the proponents humbly request your permission to be our client for our project proposal – allow us to conduct interviews and request documents related to the project. The proponents will also conduct a demonstration and evaluation of the mobile application for every progress of the project to meet the requirements of the AR mobile application for Pop Student Center, which will be beneficial to the success of this study.

The proponents hope that this request will merit your kind approval. Thank you very much.


Yours sincerely,

  
**MARC JOSEPH A. ANDAYA**

  
**RAISAH KAMILAH D. DAYTO**

  
**CLARENCE L. VELASCO**

Noted:

  
**MARC LESTER ACUNIN**  
Capstone Project and Research Adviser

  
**DANIEL E. MALIGAT JR., DIT**  
Capstone Project and Research Professor

Approved:

  
**NIÑO ROMMEL MIRANDA**  
Youth Leader

## Appendix C

### Letter for Evaluation Pre-final Defense

October 20, 2023

**DANIEL E. MALIGAT JR., DIT**  
Capstone Project and Research Professor  
This College

Sir:

In partial fulfillment of the requirement in the Bachelor of Science in Information Technology curriculum, the undersigned conducted a Capstone Project entitled "**RedeemAR: A Bible Learning App through Augmented Reality**".

In connection with this, the undersigned humbly requests the following ICS Faculty as members of our Panel Committee. Apart from that, we would like to schedule our Pre-Final Defense on **Monday, October 23, 2023, at 9:00 A.M.**

Thank you very much!

Panel Committee Members:

1. **ASST. PROF. ADRIAN G. DANIEL**  
Member
2. **NORIANNE C. LAMADRID, INSTRUCTOR I**  
Member
3. **JOCELYN O. TORIO, DIT**  
Member

	10/20/23
Signature	Date
	10/20/23
Signature	Date
	10/20/23
Signature	Date

Respectfully yours,

  
**MARC JOSEPH A. ANDAYA**  
  
**RAISAH KAMILAH D. DAYTO**  
  
**CLARENCE L. VELASCO**

Noted:

  
**MARC LESTER ACUNIN**  
Capstone Project and Research Adviser

## Appendix D

### Request Letter for Evaluation

October 27, 2023

Dear Respondents:

Greetings!

We are fourth-year Information Technology students from Camarines Norte State College. As part of our Capstone Project and Research 1 course, we are creating a project titled "REDEEMAR: A BIBLE LEARNING APP THROUGH AUGMENTED AND VIRTUAL REALITY". This project aims to help the students of the POP Student Center in Magallanes Iraya St. Purok 6 Barangay Camambugan Daet, Camarines Norte, engage more with the Bible.

We've noticed that children, especially those aged six to twelve, often find long readings challenging. Our application uses technology to make Bible stories more engaging and memorable.

One of the objectives of the study is to determine the level of usability of the developed application. In line with this we would like to seek for your assistance to spare some time to answer the attached USE questionnaire. Your feedback is crucial, and all responses will be kept confidential.

Your cooperation in this study is highly valued and appreciated. Thank you for your consideration and time.

Yours sincerely,


  
MARC JOSEPH A. ANDAYA

  
RAISAH KAMILAH D. DAYTO

  
CLARENCE L. VELASCO

Noted:

  
MARC LESTER ACUNIN  
Capstone Project and Research Adviser

  
DANIEL MALIGAT JR., DIT  
Capstone Project and Research Instructor

## Appendix E

### Invitation Letter for External Panel

October 27, 2023

**NIÑO ROMMEL MIRANDA**  
Youth Leader  
People of Promise (POP) Student Center

Dear Mr. Miranda,

We, the fourth-year students pursuing a Bachelor of Science in Information Technology at Camarines Norte State College, are reaching out in connection with our Capstone Project. Our study, titled "REDEEMAR: A BIBLE LEARNING APP THROUGH AUGMENTED AND VIRTUAL REALITY," aims to foster biblical understanding among children at the POP Student Center using advanced technology.

Following our prior communication letter requesting you to be our client, we are formally inviting you to be one of our external panelists for our final defense, scheduled for November 13, 2023, in the ICS Consultation Room. Your expertise and feedback are beneficial to the success of this project.

Thank you very much and we hope that this request will merit your kind approval.


Very truly yours,

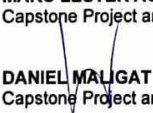
  
**MARC JOSEPH A. ANDAYA**

  
**RAISAH KAMILAH D. DAYTO**

  
**CLARENCE L. VELASCO**

Noted:

  
**MARC LESTER ACUNIN**  
Capstone Project and Research Adviser

  
**DANIEL MALIGAT JR., DIT**  
Capstone Project and Research Instructor

Approved:  
  
**NIÑO ROMMEL MIRANDA**  
Youth Leader

## Appendix F

### Letter for Final Defense

October 27, 2023

**DANIEL E. MALIGAT JR., DIT**  
Capstone Project and Research Professor  
This College

Sir:

In partial fulfillment of the Bachelor of Science in Information Technology curriculum requirement, the undersigned conducted a Capstone Project entitled "**RedeemAR: A BIBLE LEARNING APP THROUGH AUGMENTED AND VIRTUAL REALITY.**" The project aims to develop an interactive learning platform for the students of the POP Student Center, located at Magallanes Iraya St. Purok 6 Barangay Camambugan Daet, Camarines Norte. The platform utilizes augmented reality technology to enhance user engagement and understanding of the Bible.

In connection with this, the undersigned humbly requests the following ICS Faculty as members of our Panel Committee. We would also like to schedule our final defense on November 13, 2023.

Thank you very much!

Panel Committee Members:

1. **JOCELYN O. TORIO, DIT**  
Member

  
Signature

11/9/23  
Date

2. **ASST. PROF. ADRIAN G. DANIEL**  
Member

  
Signature

11/06/23  
Date

3. **NORIANNE C. LAMADRID**  
Member

  
Signature

11/06/23  
Date


Respectfully yours,

  
**MARC JOSEPH A. ANDAYA**

  
**RAISAH KAMILAH D. DAYTO**

  
**CLARENCE L. VELASCO**

Noted:

  
**MARC LESTER ACUNIN**  
Capstone Project and Research Adviser



## Appendix G

### Sample Questionnaire

#### SYSTEM EVALUATION

Dear Respondents,

The researchers are conducting a capstone project and one of the objectives is to measure the level of usability of the "RedeemAR: A Bible Learning Application Through Augmented and Virtual Reality" using the USE Questionnaire: Usefulness, Satisfaction, Ease of Use, and Ease of Learning.

Kindly provide the necessary data by checking the appropriate item presented to you. The information you entered will assist the researchers in completing the manuscript. The result of this study will be presented in summary form and the personal information you entered is confidential and will not be used outside this capstone project. Your response is highly appreciated.

Thank you and God bless.

-The researchers

After using the system, please rate following the USE Questionnaire using the scale below:

Likert-Scale Description	Likert-Scale	Likert-Scale Interval
Strongly Disagree	1	1.00 – 1.80
Disagree	2	1.81 – 2.60
Neutral	3	2.61 – 3.40
Agree	4	3.41 – 4.20
Strongly Agree	5	4.21 – 5.00

		5	4	3	2	1
<b>A. USEFULNESS</b>						
1.	It helps me to be more effective.					
2.	It helps me to be more productive.					
3.	It is useful.					
4.	It gives me more control over the activities in my life.					
5.	It makes the things I want to accomplish easier.					
6.	It saves me time when I use it.					
7.	It meets my needs.					
8.	It does everything I would expect it to do.					
<b>B. EASE OF USE</b>						
1.	It is easy to use.					
2.	It is simple to use.					
3.	It is user-friendly.					
4.	It requires the fewest steps possible to accomplish what I want to do with it.					
5.	It is flexible.					
6.	Using it is effortless.					
7.	I can use it without written instructions.					
8.	I don't notice any inconsistency as I use it.					
9.	Both occasional and regular users would like it.					
10.	I can recover from mistakes quickly and easily.					
11.	I can use it successfully every time.					
<b>C. EASE OF LEARNING</b>						
1.	I learned to use it quickly.					
2.	I easily remember how to use it.					
3.	It is easy to learn to use it.					
4.	I quickly become skillful with it.					
<b>D. SATISFACTION</b>						
1.	I am satisfied with it.					
2.	I would recommend it to a friend.					
3.	It is fun to use.					
4.	It works the way I want it to work.					
5.	It is wonderful.					
6.	I feel I need to have it.					
7.	It is pleasant to use.					

Signature of Respondent:

Name of Respondent:

Position:

Date of Evaluation:

## Appendix H

### Source Code

#### Character Slider

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.UI;

public class CharacterSlider : MonoBehaviour
{
    public GameObject scrollbar;
    public Text textDisplay; // Reference to the UI Text
    element
    float scroll_pos = 0;
    float[] pos;
    void Update()
    {
        pos = new float[transform.childCount];
        float distance = 1f / (pos.Length - 1f);
        for(int i = 0; i < pos.Length; i++) {
            pos[i] = distance * i;
        }
        if(Input.GetMouseButton(0)) {
            scroll_pos =
scrollbar.GetComponent<Scrollbar>().value;
        } else {
            for (int i = 0; i < pos.Length; i++) {
                if(scroll_pos < pos[i] + (distance/2) &&
scroll_pos > pos[i] - (distance/2)) {
scrollbar.GetComponent<Scrollbar>().value =
Mathf.Lerp(scrollbar.GetComponent<Scrollbar>().value,
pos[i], 0.1f);
                }
            }
        }
    }
}
```

```

    }
    for (int i = 0; i < pos.Length; i++) {
        if(scroll_pos < pos[i] + (distance/2) &&
scroll_pos > pos[i] - (distance/2)) {
            transform.GetChild(i).localScale =
Vector2.Lerp(transform.GetChild(i).localScale, new
Vector2(1f, 1f), 0.1f);
            for (int a = 0; a < pos.Length; a++) {
                if (a != i) {
                    transform.GetChild(a).localScale
= Vector2.Lerp(transform.GetChild(a).localScale, new
Vector2(0.8f, 0.8f), 0.1f);
                }
            }
            UpdateTextDisplay(i); // Update the text
display based on the selected item
        }
    }
}

void UpdateTextDisplay(int itemIndex)
{
    // You can implement your logic here to change
the text based on the selected item index
    // For example:
    string itemText = "Item " + (itemIndex + 1);
    if (itemIndex == 0){
        itemText = "Lalaki";
    } else if (itemIndex == 1){
        itemText = "Babae";
    } else{
        itemText = "Robot";
    }
    textDisplay.text = itemText;
}

```

## Character Selection

```
using UnityEngine;
using UnityEngine.UI;
public class SelectCharacterClick : MonoBehaviour
{
    public Image imageToUpdate; // Reference to the UI
    Image component to update
    public Sprite boySprite;      // Reference to the
    sprite for the "boy" button
    public Sprite girlSprite;     // Reference to the
    sprite for the "girl" button
    public Sprite robotSprite;    // Reference to the
    sprite for the "robot" button

    private void Start()
    {
        // Set the initial sprite of the image (optional)
        imageToUpdate.sprite = boySprite;
    }
    public void OnButtonClick(string buttonName)
    {
        switch (buttonName)
        {
            case "boy":
                imageToUpdate.sprite = boySprite;
                PlayerPrefs.SetString("Character",
"boy");
                break;
            case "girl":
                imageToUpdate.sprite = girlSprite;
                PlayerPrefs.SetString("Character",
"girl");
                break;
            case "robot":
```

```

        imageToUpdate.sprite = robotSprite;
        PlayerPrefs.SetString("Character",
"robot");

        break;
    default:
        Debug.LogWarning("Unknown button name: "
+ buttonName);
        break;
    }
}
}

```

### **Quiz Slider**

```

using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.UI;

public class QuizSlider : MonoBehaviour
{
    public GameObject scrollbar;
    float scroll_pos = 0;
    float [] pos;

    // Start is called before the first frame update
    void Start() {
    }

    // Update is called once per frame
    void Update()
    {
        pos = new float[transform.childCount];
        float distance = 1f / (pos.Length - 1f);
        for(int i = 0; i < pos.Length; i++) {
            pos [i] = distance * i;
        }
        if(Input.GetMouseButton(0)){

```

```

        scroll_pos =
scrollbar.GetComponent<Scrollbar>().value;
    } else {
        for (int i = 0; i < pos.Length; i++) {
            if(scroll_pos < pos[i] + (distance/2) &&
scroll_pos > pos[i] - (distance/2)) {

scrollbar.GetComponent<Scrollbar>().value = Mathf.Lerp
(scrollbar.GetComponent<Scrollbar>().value, pos[i],0.1f);
                }
            }
        }

        for (int i = 0; i < pos.Length; i++) {
            if(scroll_pos < pos[i] + (distance/2) &&
scroll_pos > pos[i] - (distance/2)) {
                transform.GetChild(i).localScale =
Vector2.Lerp (transform.GetChild(i).localScale, new
Vector2(1f, 1f), 0.1f);
                for (int a = 0; a < pos.Length; a++) {
                    if (a != i) {
                        transform.GetChild (a).localScale
= Vector2.Lerp(transform.GetChild(a).localScale, new
Vector2(0.8f, 0.8f), 0.1f);
                    }
                }
            }
        }
    }
}

```

### **Quiz Manager**

```

using UnityEngine;
using UnityEngine.UI;
using UnityEngine.Networking;
using System.Collections.Generic;

```

```

using TMPro;
using System.Collections;
using System.IO;
public class QuizManager : MonoBehaviour
{
    public TextMeshProUGUI questionText;
    public List<Button> optionButtons;
    public QuizResultPopup resultPopup;

    private List<Question> questions;
    private int currentQuestionIndex = 0;
    private int totalCorrectAnswers = 0;
    void Start()
    {
        questionText =
GameObject.Find("questionText").GetComponent<TextMeshProU
GUI>();
        StartCoroutine(LoadQuestionsCoroutine());
    }
    IEnumerator LoadQuestionsCoroutine()
    {
        string selectedLesson =
PlayerPrefs.GetString("SelectedLesson");
        string jsonPath =
Path.Combine(Application.streamingAssetsPath,
"QuizData/quiz_data.json");

        using (UnityWebRequest www =
UnityWebRequest.Get(jsonPath))
        {
            yield return www.SendWebRequest();
            if (www.result !=
UnityWebRequest.Result.Success)
            {

```

```

        Debug.LogError("Error loading JSON: " +
www.error);
    }
    else
    {
        string jsonData =
www.downloadHandler.text;
        QuizData quizData =
JsonUtility.FromJson<QuizData>(jsonData);

        foreach (var lesson in quizData.lessons)
        {
            if (lesson.lessonName ==
selectedLesson)
            {
                questions = lesson.questions;
                break;
            }
        }
        LoadQuestion(currentQuestionIndex);
    }
}

void LoadQuestion(int index)
{
    if (index < questions.Count)
    {
        questionText.text =
questions[index].questionText;
        for (int i = 0; i < optionButtons.Count; i++)
        {

optionButtons[i].GetComponentInChildren<TextMeshProUGUI>(
).text = questions[index].options[i];

```



```

        string selectedOption =
questions[index].options[i];
optionButtons[i].onClick.RemoveAllListeners();
        optionButtons[i].onClick.AddListener(()
=> OnOptionSelected(selectedOption));
    }
}
else
{
    resultPopup.ShowResult(totalCorrectAnswers,
true);
}
}
void OnOptionSelected(string selectedOption)
{
    string correctOption =
questions[currentQuestionIndex].options[questions[current
QuestionIndex].correctOptionIndex];
    for (int i = 0; i < optionButtons.Count; i++)
    {
        string buttonText =
optionButtons[i].GetComponentInChildren<TextMeshProUGUI>(
).text;

        if (buttonText == selectedOption)
        {
            if (selectedOption == correctOption)
            {
                totalCorrectAnswers++;
                optionButtons[i].image.color =
Color.yellow;
            }
            else
            {

```

```

        optionButtons[i].image.color =
Color.red;

        for (int j = 0; j <
optionButtons.Count; j++)
        {
            string correctButtonText =
optionButtons[j].GetComponentInChildren<TextMeshProUGUI>(
).text;

            if (correctButtonText ==
correctOption)

                {
                    optionButtons[j].image.color
= Color.yellow;

                    break;
                }
        }

    }

    optionButtons[i].interactable = false;
}

if (currentQuestionIndex == questions.Count - 1)
{
    resultPopup.ShowResult(totalCorrectAnswers,
true);
}
else
{
    Invoke("LoadNextQuestion", 2f);
}

}

void LoadNextQuestion()
{
    foreach (Button button in optionButtons)

```

```

        {
            button.image.color = Color.white;
            button.interactable = true;
        }
        currentQuestionIndex++;
        if (currentQuestionIndex < questions.Count)
        {
            LoadQuestion(currentQuestionIndex);
        }
        else
        {
            resultPopup.ShowResult(totalCorrectAnswers,
true);
        }
    }
}

[System.Serializable]
public class QuizData
{
    public List<Lesson> lessons;
}

[System.Serializable]
public class Lesson
{
    public string lessonName;
    public List<Question> questions;
}

[System.Serializable]
public class Question
{
    public string questionText;
    public List<string> options;
    public int correctOptionIndex;
}

```

### **Changing Scene**

```
using UnityEngine;
using UnityEngine.SceneManagement;
public class LoadSceneOnClick : MonoBehaviour
{
    public string sceneName; // Name of the scene to load
    (make sure the scene is added to the build settings)
    public void LoadScene()
    {
        SceneManager.LoadScene(sceneName); // Load the
specified scene
    }
}
```

### **UI Animations**

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class UIAnimation : MonoBehaviour
{
    [SerializeField]
    GameObject logo, lesson1btn, lesson2btn, lesson3btn,
lesson4btn, lesson5btn;
    void Start()
    {
        LeanTween.scale(logo, new
Vector3(1.5f,1.5f,1.5f),2f).setDelay(.5f).setEase(LeanTwe
enType.easeOutElastic);
        LeanTween.scale(logo, new Vector3(1f, 1f, 1f),
2f).setDelay(1.7f).setEase(LeanTweenType.easeInOutCubic);
    }
}
```

### **Audio Manager**

```
using UnityEngine.Audio;
using System;
```

```

using UnityEngine;

public class AudioManager : MonoBehaviour
{
    [SerializeField] private AudioMixerGroup
soundEffectsMixerGroup;
    public static AudioManager instance;
    public Sound[] sounds;
    private string currSounds;
    private bool checker = false;
    void Awake()
    {
        if (instance != null)
        {
            Destroy(gameObject);
        }
        else
        {
            instance = this;
            DontDestroyOnLoad(gameObject);
        }
        foreach (Sound s in sounds)
        {
            s.source =
gameObject.AddComponent();
            s.source.clip = s.clip;
            s.source.loop = s.loop;
            s.source.outputAudioMixerGroup =
soundEffectsMixerGroup;
        }
    }
    private void Update()
    {
        if (checker)
        {

```

```

        Sound s = Array.Find(sounds, item =>
item.name == currSounds);
        if (!s.source.isPlaying)
        {
            DialougeSystem.GetInstance().DisableTalkingAnimation
();
            checker = false;
        }
    }
    public void Play(string sound)
    {
        currSounds = sound;
        Sound s = Array.Find(sounds, item => item.name
== sound);
        checker = true;
        if (s == null)
        {
            Debug.LogWarning("Sound: " + name + " not
found!");
            return;
        }
        s.source.Play();
    }
    public void Stop()
    {
        for (int i = 0; i < sounds.Length; i++)
        {
            if (sounds[i] != null)
            {
                sounds[i].source.Stop();
            }
        }
    }
}

```

### Creation Events

```
using Ink.Runtime;
using System.Collections;
using System.Collections.Generic;
using Unity.VisualScripting;
using UnityEngine;
using UnityEngine.SceneManagement;
public class CreationEvents : MonoBehaviour
{
    public TextAsset Aralin1Script;
    private DayAndNightControl dayNightControl;
    private ChangeSunColor changeSunColor;
    public GameObject Moon;
    public GameObject Stars;
    public GameObject Clouds;
    public GameObject Terrain;
    public GameObject GrassTrees;
    public Light directionalLight;
    public GameObject FishBirds;
    public GameObject LandAnimals;
    public GameObject Humans;
    public GameObject Light;
    private Animator animation;
    private bool playScript;
    private void Start()
    {
        playScript = true;
        directionalLight = GetComponent<Light>();
        animation = Light.GetComponent<Animator>();
        dayNightControl =
FindObjectOfType<DayAndNightControl>();
        changeSunColor =
FindObjectOfType<ChangeSunColor>();
        Clouds.SetActive(false);
```

```

        Moon.SetActive(false);
        Stars.SetActive(false);
        Terrain.SetActive(false);
        GrassTrees.SetActive(false);
        FishBirds.SetActive(false);
        LandAnimals.SetActive(false);
        Humans.SetActive(false);
        StartCoroutine(StartDay());
    }
    private void EndScene()
    {
        Debug.Log("LoadScene");
        SceneManager.LoadScene("MainMenu");
    }
    public IEnumerator StartDay()
    {
        if (playScript)
        {
            yield return new WaitForSeconds(0.1f);

            StartCoroutine(DialogueSystem.GetInstance().EnterDialogue
            Mode(Aralin1Script, "Narrator"));
        }
        else
        {
            EndScene();
        }
    }
    public void AddDay()
    {
        if (playScript)
        {

```



```

        int newDay =
        ((IntValue)DialogueSystem.GetInstance().GetVariableState(
        "newDay")).value;
        dayNightControl.changeToMorning = (newDay !=
0);
    }
}
public void TriggerEvent()
{

    int eventNumber =
    ((IntValue)DialogueSystem.GetInstance().GetVariableState(
    "eventNumber")).value;
    switch (eventNumber)
    {
        case 1:
            Debug.Log(eventNumber);
            dayNightControl.changeToMorning = true;
            break;
        case 3:
            Clouds.SetActive(true);
            break;
        case 4:
            Terrain.SetActive(true);
            StartCoroutine(PauseDialogueSystem());
            break;
        case 5:
            GrassTrees.SetActive(true);
            break;
        case 6:
            changeSunColor.SunColor();
            Moon.SetActive(true);
            Stars.SetActive(true);
            break;
    }
}

```

```

        case 7:
            FishBirds.SetActive(true);
            break;
        case 8:
            LandAnimals.SetActive(true);
            break;
        case 9:
            Humans.SetActive(true);
            break;
        case 10:
            animation.SetTrigger("Trigger");
            break;
        case 11:
            playScript = false;
            break;
        default:
            System.Console.WriteLine(eventNumber);
            break;
    }
}

private IEnumerator PauseDialogueSystem()
{
    yield return new WaitForSeconds(4f);
    DialougeSystem.GetInstance().pauseDialogue = 1;
    Debug.Log("Changed Variable" +
DialougeSystem.GetInstance().pauseDialogue);
}
}

```

### **Gyroscope Rotation**

```

using UnityEngine;
using System.Collections;
using System.Collections.Generic;

public class GyroRotation : MonoBehaviour

```

```

{
    private float _initialYAngle = 0f;
    private float _appliedGyroYAngle = 0f;
    private float _calibrationYAngle = 0f;
    private Transform _rawGyroRotation;
    private float _tempSmoothing;
    [SerializeField] private float _smoothing = 0.1f;
    private IEnumerator Start()
    {
        Input.gyro.enabled = true;
        Application.targetFrameRate = 60;
        _initialYAngle = transform.eulerAngles.y;
        _rawGyroRotation = new
GameObject("GyroRaw").transform;
        _rawGyroRotation.position = transform.position;
        _rawGyroRotation.rotation = transform.rotation;
        // Wait until gyro is active, then calibrate to
reset starting rotation.
        yield return new WaitForSeconds(1);
        StartCoroutine(CalibrateYAngle());
    }
    private void Update()
    {
        ApplyGyroRotation();
        ApplyCalibration();
        transform.rotation =
Quaternion.Slerp(transform.rotation,
_rawGyroRotation.rotation, _smoothing);
        this.transform.Rotate(-
Input.gyro.rotationRateUnbiased.x, -
Input.gyro.rotationRateUnbiased.y, -
Input.gyro.rotationRateUnbiased.z);
    }
    private IEnumerator CalibrateYAngle()

```

```

    {
        _tempSmoothing = _smoothing;
        _smoothing = 1;
        _calibrationYAngle = _appliedGyroYAngle -
        _initialYAngle; // Offsets the y angle in case it wasn't
        0 at edit time.
        yield return null;
        _smoothing = _tempSmoothing;
    }
    private void ApplyGyroRotation()
    {
        _rawGyroRotation.rotation = Input.gyro.attitude;
        _rawGyroRotation.Rotate(0f, 0f, 180f,
        Space.Self); // Swap "handedness" of quaternion from
        gyro.
        _rawGyroRotation.Rotate(90f, 180f, 0f,
        Space.World); // Rotate to make sense as a camera
        pointing out the back of your device.
        _appliedGyroYAngle =
        _rawGyroRotation.eulerAngles.y; // Save the angle around
        y axis for use in calibration.
    }
    private void ApplyCalibration()
    {
        _rawGyroRotation.Rotate(0f, -_calibrationYAngle,
        0f, Space.World); // Rotates y angle back however much it
        deviated when calibrationYAngle was saved.
    }
    public void SetEnabled(bool value)
    {
        enabled = true;
        StartCoroutine(CalibrateYAngle());
    }
}

```

# Marc Joseph A. Andaya

Purok 3 San Felipe  
Basud, Camarines Norte  
09924623905  
andayamarcjoseph1@gmail.com



---

## SUMMARY:

An IT graduate with background in Java, Visual Basic, HTML, CSS, PHP, Python, JavaScript, and MySQL database. Worked as a freelancer with skills in graphic design and video editing. Has experience with being a freelance artist and illustrator. Detail-oriented, motivated, and skilled in writing and technical support. Can work effectively both independently and in groups

---

## PERSONAL BACKGROUND:

DATE OF BIRTH:	February 5, 2002
PLACE OF BIRTH:	Basud, Camarines Norte
AGE:	21
SEX:	Male
HEIGHT:	5'2"
WEIGHT:	48 kgs.
CIVIL STATUS:	Single
CITIZENSHIP:	Filipino
RELIGION:	Roman Catholic

---

## EDUCATIONAL BACKGROUND:

<b>TERTIARY:</b>	Camarines Norte State College A.Y. 2020 - 2024 BS Information Technology Daet, Camarines Norte
<b>SECONDARY:</b>	Microsystems College Foundation, Inc. S.Y. 2018 - 2020 Daet, Camarines Norte San Felipe National High School A.Y. 2014 - 2018 Basud, Camarines Norte

**PRIMARY:** San Felipe Elementary School  
A.Y. 2008 - 2014  
Basud, Camarines Norte

---

#### **TECHNICAL SKILL**

Adept in Microsoft Office Applications such as:

- ✓ Microsoft Excel
- ✓ Microsoft PowerPoint
- ✓ Microsoft Word

#### **Graphics:**

- ✓ Adobe Photoshop and Illustrator
- ✓ Adobe InDesign
- ✓ Adobe Premier Pro and After Effects
- ✓ 3ds Max
- ✓ Blender
- ✓ Canva

#### **Programming Language:**

- ✓ Advance knowledge in Java, Visual Basic, and PHP
- ✓ HTML, CSS, MySQL, and JavaScript
- ✓ Basic knowledge in Python and C++
- ✓ Android Development using Unity and Android Studio

#### **OTHERS:**

- ✓ Basic Knowledge in Computer Hardware
  - ✓ Basic Knowledge in Networking
  - ✓ Basic Knowledge in Robotics
- 

#### **PERSONAL CHARACTERISTICS**

- Motivated Team player
  - Fast learner in a programming language
  - Willful to persevere, learn, and amass new knowledge.
  - Good Communicator
  - Compassionate and service oriented
- 

#### **SEMINARS AND CONFERENCE ATTENDED**

- DICT Python Programming Essentials Training  
June 14-25, 2021  
Via Zoom
- 2023 PAPSAS Interactive Youth Forum  
March 09-11, 2023  
Venus Parkview Hotel, Baguio City

- 11<sup>th</sup> Bicol Youth Congress in Information Technology  
April 20-21, 2023  
Camarines Sur Polytechnic Colleges
  - 2023 OSSEI National Conference and Training in Campus  
Journalism  
September 28-30, 2023  
Crown Legacy Hotel, Baguio City
- 

**REFERENCES:**

- **DANIEL E. MALIGAT JR., DIT**  
ICS, Director  
Camarines Norte State College  
Daet, Camarines Norte
- **MARC LESTER ACUNIN**  
Instructor 1  
Camarines Norte State College

I hereby certify that the pieces of information presented above are true and correct to the best of my knowledge and belief.

  
**MARC JOSEPH A. ANDAYA**

# Raisah Kamilah D. Dayto

Purok 3 Bibirao  
Daet, Camarines Norte  
09387228186  
raisahkamilahdayto@gmail.com



---

## SUMMARY:

An IT graduate from Camarines Norte State College, I bring a comprehensive suite of programming skills, with proficiencies in Java, C#, Unity for game development, and a range of web technologies including HTML, CSS, PHP, Python, JavaScript, and SaSS, anchored by solid MySQL database management. My professional experience is characterized by a commitment to excellence and innovation, particularly in roles requiring the creation of impactful graphics and strategic social media content. With a proven ability to analyze data and optimize digital campaigns, I excel at applying my technical knowledge from the Adobe Creative Suite and Microsoft Office Suite to real-world business challenges. Adept at synthesizing complex information, I am well-equipped to contribute to technology-driven environments where precision, analytical thinking, and effective project execution are valued.

---

## PERSONAL BACKGROUND:

DATE OF BIRTH:	August 12, 2002
PLACE OF BIRTH:	Daet, Camarines Norte
AGE:	21
SEX:	Female
HEIGHT:	5'2"
WEIGHT:	55 kgs.
CIVIL STATUS:	Single
CITIZENSHIP:	Filipino
RELIGION:	Roman Catholic

---

## EDUCATIONAL BACKGROUND:

<b>TERTIARY:</b>	Camarines Norte State College
	A.Y. 2020 - 2024
	BS Information Technology
	Daet, Camarines Norte



<b>SECONDARY:</b>	Camarines Norte National Highschool S.Y. 2018 - 2020 Daet, Camarines Norte
	Camarines Norte National Highschool A.Y. 2014 - 2018 Daet, Camarines Norte
<b>PRIMARY:</b>	Don S. Carranceja Memorial School A.Y. 2008 - 2014 Daet, Camarines Norte

---

## TECHNICAL SKILL

### ADOBE CREATIVE SUITE

- Adeptly utilizes Photoshop, Illustrator, After Effects, Premiere, and Lightroom to create visually compelling graphics, animations, videos, and photo enhancements, leveraging a wide range of design and multimedia capabilities.

### MICROSOFT OFFICE SUITE

- Able to analyze and visualize data in Excel, document and communicate effectively with Word, and design persuasive presentations with PowerPoint.

### GOOGLE ADS

- Strategic in campaign management, from keyword research and ad creation to bid management and conversion tracking, with a focus on maximizing campaign efficacy.

### PROGRAMMING

- Versed in Java and C# for application development, Unity for game design, Visual Basic, HTML, CSS, SaSS for web design, plus PHP, Python, and JavaScript for scripting and interactivity. Proficient in MySQL for database integrity and complex queries, committed to writing clean, efficient code.
-

## **PERSONAL CHARACTERISTICS**

- Analytical and detail-oriented with a penchant for precision in complex tasks.
  - Agile learner and innovative problem-solver who embraces new challenges.
  - Collaborative team player with strong communication skills.
  - Resilient and tech-savvy professional with a commitment to ethical standards.
- 

## **PROFESSIONAL EXPERIENCE**

### **JM MARKETING LLC**

Virtual Executive Assistant and      August 2023 - Present  
Graphic Designer

- Provided CEO with comprehensive administrative support at JM MARKETING LLC, improving time management and productivity.
- Designed engaging graphics, including infographics, for increased online engagement.
- Played a key role in successful event planning and coordination for JM MARKETING LLC.
- Proficient in Adobe Creative Suite, including Photoshop and Illustrator, for tailored marketing graphics.
- Managed and enhanced Facebook pages for Tampa City Rentals, JM Fleet Builder Mentorship, and SD City Rentals, increasing online visibility.
- Crafted distinctive logos for Tampa City Rentals, SD City Rentals, JM Fleet Builder Mentorship, and GoAround Enterprises, boosting brand recognition.
- Assisted in creating customized contracts for clients at JM MARKETING LLC, reducing disputes and ensuring legal compliance.
- Developed comprehensive Standard Operating Procedures (SOPs) for various positions within JM MARKETING LLC, enhancing operational efficiency and consistency.

### **MONEY MASTERY INSTITUTE (MMI)**

Google Ads Specialist and YouTube      June 2023 - August  
Account Manager      2023

- Provided Data-Driven Insights by regularly analyzing campaign data, generating detailed performance reports, and presenting actionable insights to the marketing team, contributing to informed decision-making.
- Developed compelling ad creatives and performed rigorous keyword research, resulting in a substantial improvement in overall campaign

performance.

- Initiated and launched a new YouTube Account to optimize Google Ads Video Campaign.
- Conceptualized and executed a tailored YouTube banner for enhanced visual branding.

**GROUNDWATER PRIVATE RESORT**

November 2022 – July 2023

Social Media Manager

- Strategically curated compelling visual content by spearheading the creation of captivating publication materials that showcased the brand's identity.
- Crafted compelling and on-brand captions for Facebook posts that resonated with the target audience of the business by using my adept copywriting skills.
- Innovatively conceptualized and meticulously crafted the official business logo, aligning it with the brand's core values.

**MERAKI-TECH PRECISION CORPORATION**

May 2019 – June

Human Resources Encoder (Part-time)

2019

- Optimized collaboration for timely HR operations by collaborating seamlessly with cross-functional HR teams to meet demanding data entry deadlines.
- Pioneered process improvement initiatives by identifying opportunities for workflow enhancements within the data entry process using MS Excel and actively contributed ideas for improved efficiency.
- Initiated the integration of data validation automation tools, leading to a substantial reduction in data entry errors.

---

**REFERENCES:**

- **DANIEL E. MALIGAT JR., DIT**  
ICS, Director  
Camarines Norte State College
- **MARC LESTER ACUNIN**  
Instructor 1  
Camarines Norte State College
- **JOSE MORENO**  
Chief Executive Officer  
  
JM Marketing LLC
- **KEVIN JARAMILLO**  
Chief Executive Officer  
Money Mastery Institute

- **MARY ANN MABEZA**  
Business Woman  
Groundwater Private Resort

I hereby certify that the pieces of information presented above are true and correct to the best of my knowledge and belief.

  
**RAISAH KAMILAH D. DAYTO**

# Clarence L. Velasco

Purok 5-A, Brgy. San Isidro  
Daet, Camarines Norte  
09319826319  
Velascoclarencel2@gmail.com



---

## SUMMARY:

An IT graduate with background in Java application, Visual Basic, HTML, CSS, PHP, Python, JavaScript, React, SaSS, GraphQL database, and MySQL database. Worked as a freelancer with skills in digital art and graphic design, as well as photography and video editing. Has experience with being a freelance artist and illustrator. Detail-oriented, motivated, and skilled in writing and technical support. Can work effectively both independently and in groups

---

## PERSONAL BACKGROUND:

DATE OF BIRTH:	April 11, 2002
PLACE OF BIRTH:	Daet, Camarines Norte
AGE:	21
SEX:	Male
HEIGHT:	5'7"
WEIGHT:	69 kgs.
CIVIL STATUS:	Single
CITIZENSHIP:	Filipino
RELIGION:	Roman Catholic

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## EDUCATIONAL BACKGROUND:

<b>TERTIARY:</b>	Camarines Norte State College A.Y. 2020 - 2024 BS Information Technology Daet, Camarines Norte
<b>SECONDARY:</b>	Microsystems College Foundation Inc. A.Y. 2018 - 2020 Daet, Camarines Norte

Moreno Integrated School  
A.Y. 2014 - 2018  
Daet, Camarines Norte

**PRIMARY:** Daet Elementary School  
A.Y. 2008 - 2014  
Daet, Camarines Norte

---

## **TECHNICAL SKILL**

### **ADOBE CREATIVE SUITE**

- Adeptly utilizes Photoshop, Illustrator, After Effects, Premiere, and Lightroom to create visually compelling graphics, animations, videos, and photo enhancements, leveraging a wide range of design and multimedia capabilities.

### **MICROSOFT OFFICE SUITE**

- Able to analyze and visualize data in Excel, document and communicate effectively with Word, and design persuasive presentations with PowerPoint.

### **MULTIMEDIA PRODUCTION**

- Able to write, produce, shoot, and edit various forms of video content depending on purpose, target audience, and style.

### **COMPUTER MAINTENANCE**

- Able to perform troubleshooting and repairing different types of computer issues on both hardware and software as well as device maintenance measures.

---

## **PERSONAL CHARACTERISTICS**

- Motivated Team player
- Fast learner in a programming language
- Willful to persevere, learn, and amass new knowledge.
- Good Communicator
- Compassionate and service oriented

---

## **SEMINARS AND CONFERENCE ATTENDED**

- 11<sup>th</sup> Bicol Youth Congress in Information Technology  
April 21- 22, 2023

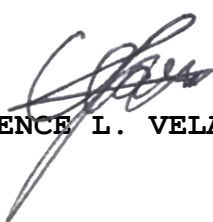
Camarines Sur Polytechnic Colleges, Nabua, Camarines  
Sur

---

**REFERENCES:**

- **DANIEL E. MALIGAT JR., DIT**  
ICS, Director  
Camarines Norte State College  
Daet, Camarines Norte
- **MARC LESTER ACUNIN**  
Instructor 1  
Camarines Norte State College

I hereby certify that the pieces of information presented  
above are true and correct to the best of my knowledge and  
belief.

  
**CLARENCE L. VELASCO**