



---

SECP1513 – TECHNOLOGY AND INFORMATION SYSTEM

SEMESTER 1 – SESI 2023/2024

ASSIGNMENT 1 : REPORT ON VISIT TO NALI 2023

LECTURER NAME : TS. DR. SARINA BINTI SULAIMAN

STUDENT'S NAME	MATRIC NO
NUR AMIERA ZULAIKHA BINTI HARDI	A23CS0153
PUTERI NURUL SYAHIRAH BINTI MOHD NAZRI	A23CS0172
TAN SZE QING	A23CS5048
CHENG KANG HUEY	A23CS0216
ALICE LEE HUI MEE	A23CS0040

DATE : 14 NOVEMBER 2023

## TABLE OF CONTENT

<b>CONTENT</b>	<b>PAGE</b>
1.0 INTRODUCTION <ul style="list-style-type: none"> <li>• OVERVIEW OF THE PROGRAM VISIT</li> <li>• INTRODUCTION OF GROUP</li> </ul>	3 4
2.0 POSTERS <ul style="list-style-type: none"> <li>• 2.1 TRANSFORMING SCHOOL INNOVATION COMPETITION TO EMPOWER HOLISTIC GRADUATES FOR CULTIVATING YOUNG INNOVATIVE SUSTAINABILITY ADVOCATES</li> <li>• 2.2 PROGRAMMING RESILIENCE SKILLS THROUGH COMPETITION-BASED LEARNING USING MOBILE ROBOTS IN REAL-TIME SOFTWARE ENGINEERING COURSE</li> <li>• 2.3 UTM ECO MOBILE APP : BIODIVERSITY GEO-TAGGED ECOTOURISM EXPERIENCE ON UTM CAMPUS</li> <li>• 2.4 EQUINUTRICHECK : A COMPREHENSIVE HORSE NUTRITION SOLUTION</li> <li>• 2.5 PUZZLE GAME-BASED LEARNING AS A TOOLS TO ENHANCED STUDENTS PERFROMANCE</li> </ul>	5 6 7 8 9
3.0 INTERVIEW SESSION	10
4.0 REFLECTION <ul style="list-style-type: none"> <li>• 4.1 TRANSFORMING SCHOOL INNOVATION COMPETITION TO EMPOWER HOLISTIC GRADUATES FOR CULTIVATING YOUNG INNOVATIVE SUSTAINABILITY ADVOCATES</li> <li>• 4.2 PROGRAMMING RESILIENCE SKILLS THROUGH COMPETITION-BASED LEARNING USING MOBILE ROBOTS IN REAL-TIME SOFTWARE ENGINEERING COURSE</li> <li>• 4.3 UTM ECO MOBILE APP : BIODIVERSITY GEO-TAGGED ECOTOURISM EXPERIENCE ON UTM CAMPUS</li> <li>• 4.4 EQUINUTRICHECK : A COMPREHENSIVE HORSE NUTRITION SOLUTION</li> <li>• 4.5 PUZZLE GAME-BASED LEARNING AS A TOOLS TO ENHANCED STUDENTS PERFROMANCE</li> </ul>	11-12 13-14 15 16-17 18-19
5.0 CONCLUSION	20

## **1.0 INTRODUCTION**

### **OVERVIEW OF THE PROGRAM VISIT**

According to the official website, NALI is an annual knowledge sharing event organised by Universiti Teknologi Malaysia ( UTM ), through Center for Advancement in Digital and Flexible Learning ( UTM CDex ). NALI also stands for New Academia Learning Innovation, a framework to promote innovative teaching and learning practices in education. It comprises student-centred and blended learning philosophy, multiple learning modes and materials towards achieving entrepreneurial academia.

With their theme of "Resilience Education for Future-Oriented Quality Graduates", NALI 2023 focuses on cultivating resilience among individuals. Resilience education involves the ability to recover from tough times, adjust to new situations, and handle stress effectively. It teaches us important skills such as problem-solving, managing emotions, social skills, and dealing with stress. Its main aim is to help people confidently overcome obstacles without feeling stressed or helpless.

Our group visited NALI 2023 on 7th November 2023 to gain more knowledge about the innovations of Information and Communication Technology ( ICT ) in teaching and learning. We visited booths around the venue to look at each of the innovations in ICT showcased. To learn more about these innovations, we have also conducted interview sessions with five participants in NALI 2023. Through comprehensive analysis and information gathered during our visit and interviews, we hope to provide a thorough understanding of the impactful innovations in ICT and their effect on teaching and learning.

# INTRODUCTION OF GROUP GROUP 06 SECTION 07 TASKMASTERS



Group Leader :  
**Nur Amiera Zulaika  
Binti Hardi**

Matric number:  
**A23CS0153**

Group Member:  
**Tan Sze Qing**

Matric number:  
**A23CS5048**

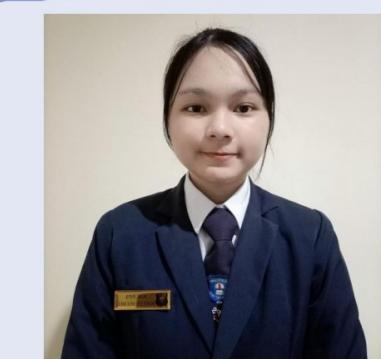


Group Member:  
**Puteri Nurul Syahirah  
Binti Mohd Nazri**

Matric number:  
**A23CS0172**

Group Member:  
**Cheng Kang Huey**

Matric number:  
**A23CS0216**

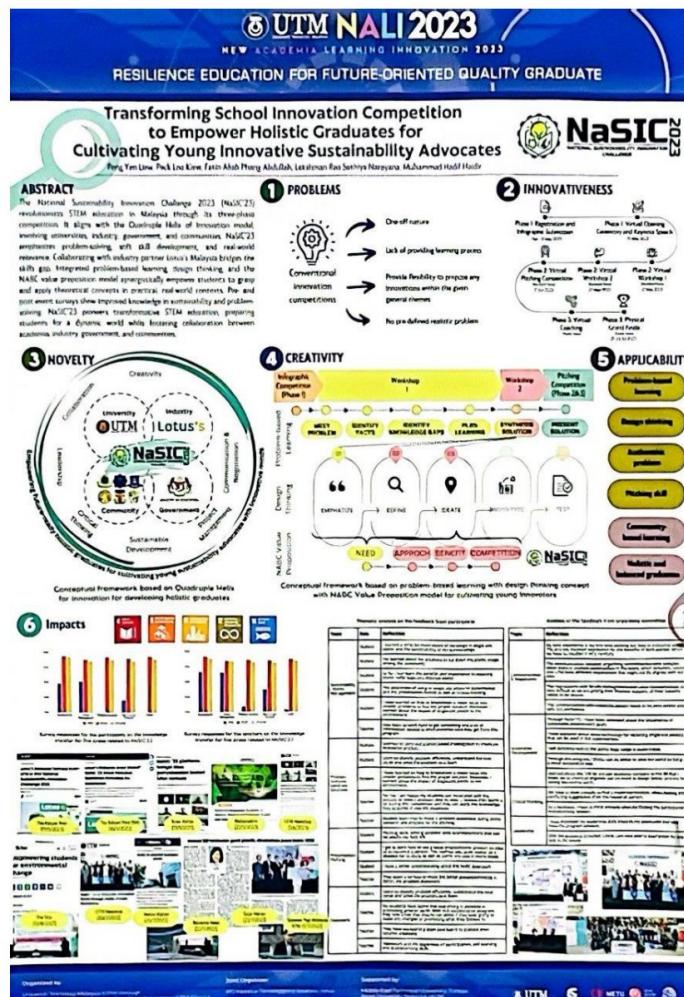


Group Member:  
**Alice Lee Hui Mee**

Matric number:  
**A23CS0040**

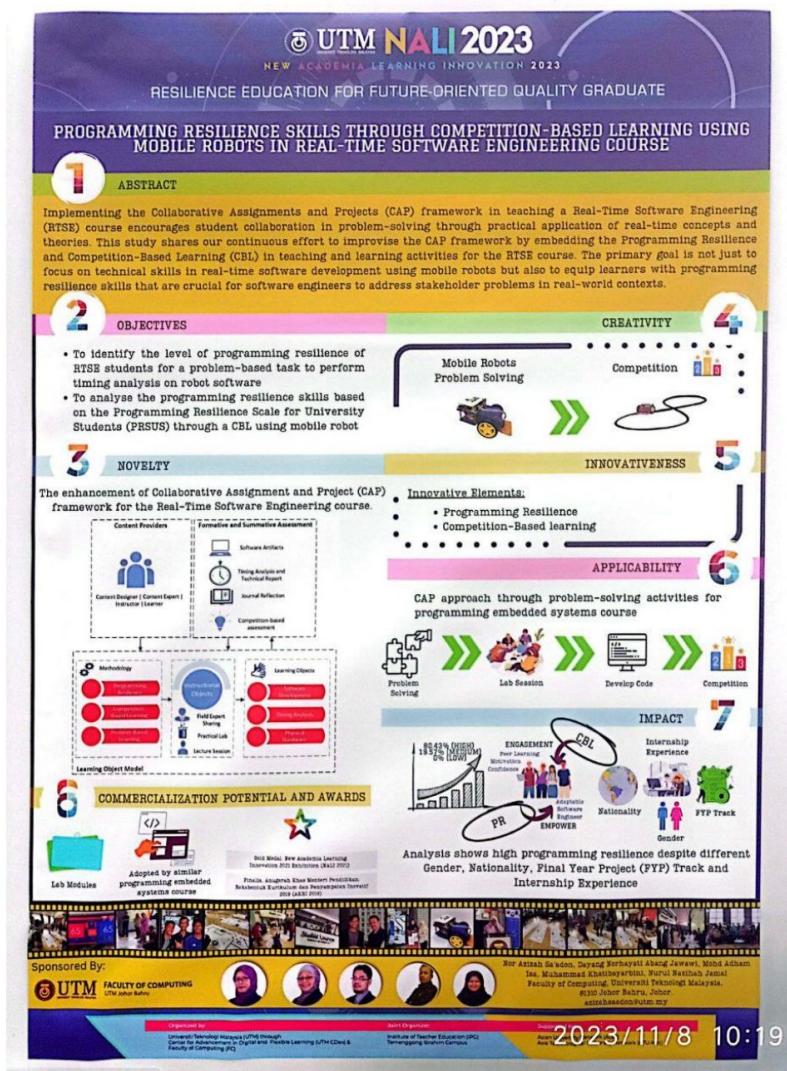
## 2.0 POSTERS

### 2.1 TRANSFORMING SCHOOL INNOVATION COMPETITION TO EMPOWER HOLISTIC GRADUATES FOR CULTIVATING YOUNG INNOVATIVE SUSTAINABILITY ADVOCATES



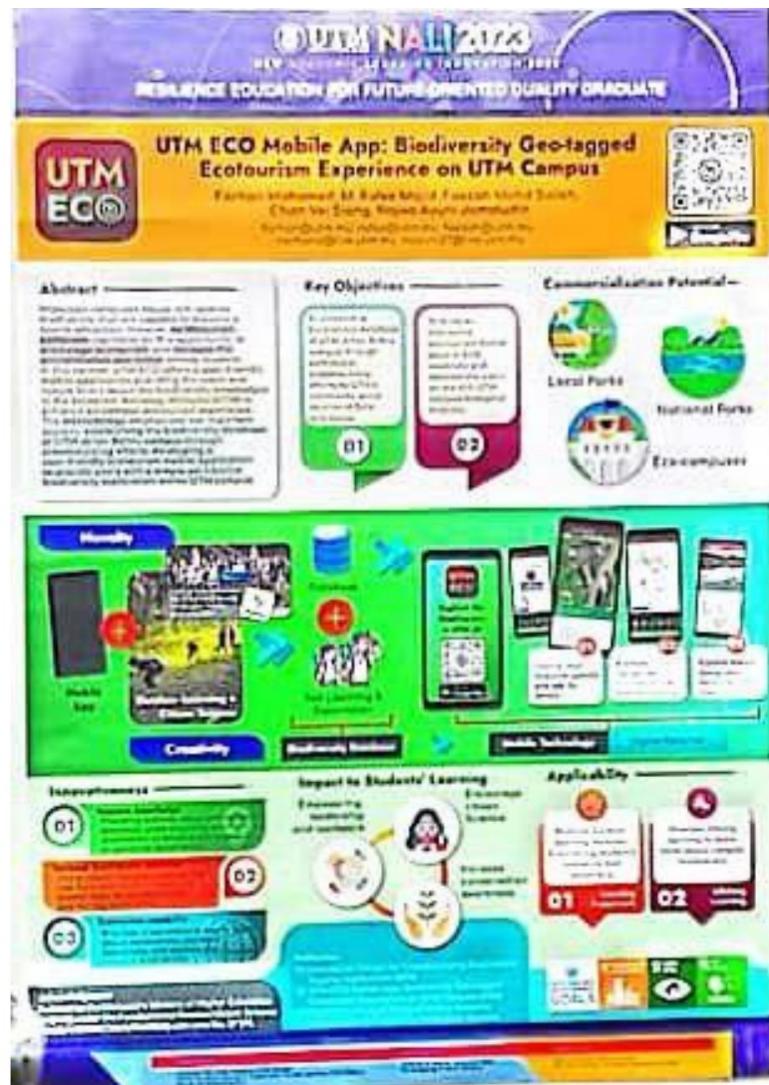
This poster shows the innovation in Innovation and Communication Technology ( ICT ) and its application in education, such as innovative teaching and learning. For your information, MJIIT-UTM and Lotus Store (M) Sdn Bhd ( Lotus's Malaysia ) go together to promote sustainability among the younger generation in Malaysia by organizing the first-ever National Sustainability Innovation Challenge 2023 ( NaSIC '23 ). The program makes participating students aware of the alarming sustainability issues around us and familiar with structural problem-solving methods. This important industrial collaboration event also allows UTM students to be exposed to the working culture in the real world and integrated problem-based learning design thinking.

## 2.2 PROGRAMMING RESILIENCE SKILLS THROUGH COMPETITION-BASED LEARNING USING MOBILE ROBOTS IN REAL-TIME SOFTWARE ENGINEERING COURSE



This poster explained its innovation for teaching and learning in Innovation and Communication Technology ( ICT ) through a Competition-Based Learning ( CBL ) activity using mobile robots in a real-life software engineering course. With the target audience of software engineering students, this activity offers a fun way to develop programming resilience skills for them, which involved timing analysis that is mainly used in the mobile robot's operation system and is highly focused on their course. With this approach, students are taught to implement real-life concepts and theories to solve problems using robot software. In addition, this innovation also allows students' programming resilience's level to be identified and polished for real-world contexts as a software engineers in the future.

## 2.3 UTM ECO MOBILE APP : BIODIVERSITY GEO-TAGGED ECOTOURISM EXPERIENCE ON UTM CAMPUS



UTM ECO Mobile App is definitely a good choice for students who are nature lovers on the UTM campus. Its main objectives are to establish a biodiversity database on the campus through crowdsourcing efforts and build interactive ecotourism mobile apps. This app really benefits students in many aspects. Based on the interviewee, students at UTM are able to have customized and personalized experience when exploring the flora and fauna on campus. Furthermore, the application of this app promotes more outdoor learning and also strengthens the resilience and leadership of students. Its innovation is to broaden knowledge, increase biodiversity databases, and promote ecotourism. When it comes to its applicabilities, it promotes learning outside the classroom and provides lifelong learning about campus biodiversity.

## 2.4 EQUINUTRICHECK : A COMPREHENSIVE HORSE NUTRITION SOLUTION

The poster is titled "EquiNutriCheck : A Comprehensive Horse Nutrition Solution" and is presented at the "RESILIENCE EDUCATION FOR FUTURE-ORIENTED QUALITY GRADUATE" session during UTM NALI 2023. It features several sections: INTRODUCTION, OBJECTIVES, RESEARCH METHODOLOGY, FINDING AND DISCUSSION, HIGHLIGHT, NOVELTY, COMMERCIALIZATION POTENTIAL, CONCLUSION, and REFERENCES.

**HIGHLIGHT**

EquiNutriCheck is an innovative and user-friendly solution for optimizing horse nutrition management. EquiNutriCheck provides a comprehensive database of nutritional requirements customized to the various physiological stages of horses by integrating the most recent equine nutrition research with the functionality of Microsoft Excel. Users can rapidly determine whether their horse's nutrition satisfies the precise nutrient requirements by entering data particular to horses. The project is aimed at bridging the knowledge gap between theory and practice by offering horse owners and students a practical approach to improve the health, performance, and general well-being of horses through appropriate nutrition management.

**INTRODUCTION**

The current approach to determine the nutrient requirement of horses

- > National Research Council (NRC) (2007) guideline
- Limitation (Lawrence, 2022)
- > Time-consuming
- > Prone to error

Computer based-approach (Longland et al., 2018).

- > Power of data analysis and predictive algorithm
- > Accurate
- > Personalized feeding program for individual horses

**OBJECTIVES**

- ① To provide a practical and user-friendly tool for students in equine nutrition.
- ② To calculate and compare nutrient requirements based on different physiological stages and activity levels of horses.
- ③ To enhance understanding of equine nutrition concepts and promote informed decision-making.
- ④ To improve overall horse health and well-being through optimal nutrient management.

**RESEARCH METHODOLOGY**

Flowchart showing the methodology: Identification → Literature Review → Data Collection → Analysis → Conclusion.

**FINDING AND DISCUSSION**

Empowerment through education - enhance user understanding, and reinforce theoretical knowledge with practical application.

Fig 1. EquiNutriCheck Homepage - Fusing technology and science for horse nutrition

Fig 2. Information on fundamental concept of horse nutrition

**HIGHLIGHT**

Time and resource efficiency - dynamic calculation and summary visualization.

Fig 3. EquiNutriCheck Nutrient Calculator (user need to input horse body weight and physiological status)

Practical decision making among students - conditional formating clearly represents nutrient intake vs nutrient requirements.

Fig 4. Feed nutrient analysis (user can make a comparison the feed provided is meeting the horse nutrient requirements or not)

**NOVELTY**

- Promotes optimal horse health and performance as equine nutritionist and students benefit from a powerful educational resources.
- Unique integration of technology and scientific knowledge sets EquiNutriCheck apart from traditional methods of nutrient assessment.
- Highly applicable to various stakeholders, including horse owners, nutritionists, veterinarians, and students studying equine nutrition
- Bridges the gap between theoretical equine nutrition concepts and practical application

**COMMERCIALIZATION POTENTIAL**

- Can be marketed to the horse owner, trainers, nutritionists, veterinarians and educational institutions
- Selling point – optimize nutrient management and improve horse health and performance
- Offered as subscription-based service or sold as a downloadable software package

**CONCLUSION**

- ✓ EquiNutriCheck is an innovative and impactful solution for optimizing horse nutrition management.
- ✓ Its enhanced nutrient management, education, efficiency, and practical decision-making highlighted its significance in the equine industry.

Lawrence L (2022). The Nutrient Requirements of Horses. In: National Research Council. NRC's Nutrient Requirements of Horses. Washington, DC: National Academies Press.

Longland L, C., Longland, S., & Longland, D. (2018). Equine Nutrition: Theory and Practice. 2nd edn. London: CABI.

The innovation in ICT and learning shown in this poster include the integration of technology and education. It uses an Excel workbook to automatically calculate the nutrients of horses and their feed for both educators and students. It provides a practical and user-friendly tool for students in the subject of equine nutrition which helps them to calculate and compare nutrient requirements based on different horses. The use of ICT, which is the Excel workbook here helps students to bypass complex calculations to get accurate and precise answers easily. Thus, it is an innovative solution for optimizing horse nutrition management in learning and teaching.

## **2.5 PUZZLE GAME-BASED LEARNING AS A TOOLS TO ENHANCED STUDENTS PERFORMOMCE**

UTM NALI 2023

NEW ACADEMIC LEARNING INNOVATION 2023

RESILIENCE EDUCATION FOR FUTURE-ORIENTED QUALITY GRADUATE

# PUZZLE GAME-BASED LEARNING AS A TOOLS TO ENHANCED STUDENTS PERFORMANCE

Nurul Syakima Mohd Yusoff, Nurul Hana Adi Malmun, Zakri Tarmizi, Low Sheau Ting

Real Estate, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Centre for Real Estate Studies, Institute for Smart Infrastructure and Innovative Construction, Universiti Teknologi Malaysia.

[dx.doi.org/10.5281/zenodo.7520354](http://dx.doi.org/10.5281/zenodo.7520354)

**Highlights:** The performance of students learning is a crucial issue that needs to give attention. Therefore, learning with high educational quality requires an advanced intervention. Nowadays, there are more interactive learning tools that can be used in teaching and learning such as educational games. Educational games make the learning process more fun and enjoyable and create a competitive classroom environment for active learning. The purpose of this study was to evaluate the effectiveness and student's perceptions toward puzzle games as an active learning tool in teaching and learning. The results show that 80% of respondents reported an increase in their knowledge following their engagement with puzzle game-based learning activities.

**Key words:** Puzzle Game; Learning Tools; Active Learning; Student Performance

## Introduction

Education plays a pivotal role in nurturing cognitive performance. In an effective learning process, learners experience the cultivation of their understanding and cognitive abilities, encompassing rapid thinking (processing speed), information retention (working memory), adaptive goal pursuit (cognitive control), and problem-solving prowess (argument) (Mulyana, 2022).

## Content

### Project or Innovation objectives

Educational games encompass a diverse array of classroom tools designed to enhance the learning experience. These games not only inject enjoyment into the educational process but also wield the power to positively impact student performance. Among these educational games, Puzzle Games-based learning stands out as a potent resource for active learning, effectively bolstering memory retention.

Furthermore, the Aussie Childcare Network (2022) has outlined specific objectives for puzzle game-based learning, aimed at fostering a child's holistic development. These objectives encompass nurturing visual-perception skills, helping children focus and concentration, refining hand-eye coordination, and fine motor skills, strengthening language skills through verbalizing puzzle-solving processes, and nurturing critical thinking abilities, including memory, matching, sorting, recognition, and problem-solving.

In light of these considerations, this study is designed to explore the effectiveness of puzzle game-based learning and to gauge student perceptions regarding this active learning tool.

### NALI approach implemented in the research (e.g., novelty, creativity, innovativeness, applicability, and impact)

Puzzle games-based learning offers a versatile learning experience that can be undertaken individually or collaboratively in groups. However, in a safe, positive communication, teamwork, and an engaging atmosphere, these activities are typically conducted in a group setting. During a typical class session, students are organized into groups and tasked with completing a puzzle. Prior to commencing the activity, students receive an informative introduction to the topic, often accompanied by a video presentation to enhance their comprehension. Subsequently, students are presented with a question posed in the form of a puzzle, challenging them to solve it to arrive at an answer.

This dynamic active learning approach serves as a catalyst for the development of critical thinking skills, particularly memory retention and concentration, while also fostering a sense of healthy competition within the classroom. Feedback pertaining to the activity is systematically collected through various channels, including survey forms and online platforms such as Padlets, forums, WhatsApp, among others.

## Research Methodology, Finding and discussion of the project or innovation

Face to face activity within 2 different group:

```

graph TD
    PS[Primary school students] --> PP[Picture puzzle]
    HI[Higher institution students] --> PP
    PP --> SF[Survey form]
    SF --> FB[Feedback from the activity]
    FB --> F[Findings]
    F --> OP[Online platform: Padlet]
  
```

✓ 80% of respondents reported an increase in their knowledge following their engagement with puzzle game-based learning activities.

✓ Furthermore, these students expressed not only contentment but also genuine enjoyment while participating in these educational activities.

✓ Feedback from higher educational institution students consistently highlighted the positive and innovative nature of puzzle game-based learning. It was characterized as enjoyable, engaging, easy to comprehend, fostering active and engaged teaching, and effective to scaffold learning and successful in maintaining interest in the classroom environment.

This sentiment resonated with the findings presented by Aussie Childcare Network (2022), which underscored a multitude of benefits associated with puzzle game-based learning, including the development of gross and fine motor skills, hand-eye coordination, problem-solving abilities, memory retention, enhanced self-esteem, socialization, language and concept development, a sense of accomplishment and self-confidence, perseverance, heightened concentration, and the relief of tension. These compelling results collectively affirm the positive reception of puzzle game-based learning activities among students, ultimately indicating a potentially transformative impact on student performance.

The authors would like to thank the management for the grants provided and students and faculty for their support and participation in this research. This research was funded by the Ministry of Higher Education (MOHE) under the Research University Grant (RUG) (Ref. No.: QJ130000.2622.0202.0202) and the Academic Research Fund (ARF) (Ref. No.: QJ130000.2622.0202.0202). The authors would like to thank the editor and anonymous reviewers for their valuable comments and suggestions that greatly improved the manuscript.

Copyright © 2023, the Author(s). Published by Atlantis Press B.V. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction is permitted, and given to the author(s) and Penerbit UTM Press, the exclusive licensee, the right to first publish or distribute this work for non-commercial purposes, with an acknowledgement of the original author(s) and Penerbit UTM Press.

This poster explores Innovation and Communication Technology (ICT) and its application to innovative teaching and learning practices in education. It investigates the effectiveness of Puzzle Game-Based Learning, focusing on its impact on student performance and perceptions. Puzzle Game-Based Learning helps students hone attention and concentration, strengthen language skills through verbalizing puzzle-solving processes, and enhance memory retention. As a result, the innovation of puzzle game-based learning can affect academic performance by allowing students to improve their problem-solving abilities and gain a deeper understanding of their studies. Hence, it is an innovative solution that enhances students' performance in learning and teaching.

### **3.0 INTERVIEW SESSION**

Youtube Link :

<https://www.youtube.com/watch?v=-Fls4CPxC78>



## **4.0 REFLECTION**

### **4.1 TRANSFORMING SCHOOL INNOVATION COMPETITION TO EMPOWER HOLISTIC GRADUATES FOR CULTIVATING YOUNG INNOVATIVE SUSTAINABILITY ADVOCATES**

The name of this project is Transforming School Innovation Competition To Empower Holistic Graduates For Cultivating Young-Innovative Sustainability Advocates. In my opinion, it really gives benefits to all the students after they spend a lot of money on making this project successful. These activities often foster critical thinking, problem-solving skills, teamwork, and creativity. Additionally, engaging in sustainability-focused projects can still foster a sense of responsibility and awareness about environmental issues. It will develop more skills in the students without their knowledge.

These activities, especially the innovative one on a program ceremony using a virtual platform, have a positive impact on the outcome of the course or subject. By engaging in innovative projects and competitions, students apply theoretical knowledge in practical settings. This application of knowledge enhances their understanding and retention, making the learning experience more meaningful. It also provides a deeper understanding and connection between theoretical facts and their real-world applications.

From this project, I have learned that this project will give students a good impact and lessons from participating in these activities. From someone who doesn't know anything about the ICT industry to someone who wants to know and try something new about ICT. Obviously, it will make the students want to make some innovations from what they learn. Moreover, they gain hands-on experience, problem-solving abilities, and the ability to think critically. These practical skills are often as important as theoretical knowledge, and they contribute significantly to the student's personal and professional development.

Basically, as a student, I truly enjoy and really want to get through this project. Engaging in innovative competitions tends to spark excitement and interest among students. The hands-on nature of these activities, coupled with the element of competition, can make learning more enjoyable. This excitement can translate into happiness, positive feedback towards learning, and a willingness to explore and gain more ideas on doing something.

Last but not least, visiting NALI 2023 and participating in interview sessions can significantly enhance the learning of course material. Practical exposure through interaction with experts and competition between expert participants and industry professionals provides valuable insight and opportunities beyond the classroom. It allows students to connect theoretical concepts with real-world applications, providing a deeper understanding of the subject matter. This experiential learning contributes to a more comprehensive understanding of sustainability concepts and their application in various contexts. Additionally, the networking opportunities during such events can open doors to future collaborations and career prospects, enriching the overall educational experience.

## **4.2 PROGRAMMING RESILIENCE SKILLS THROUGH COMPETITION-BASED LEARNING USING MOBILE ROBOTS IN REAL-TIME SOFTWARE ENGINEERING COURSE**

Teaching and learning activities for the Real-Time Software Engineering Course using the Competition-Based Learning Method give benefit to the students, especially from the same course, because they are exposed to practical application in solving problems related to the concepts and theories that they have learned and how to implement them in real-time situations. In addition, these activities not only help them to improve their technical skills through mobile robots but also boost their programming resilience skills, which are significant in their future career as a software engineer. These skills are crucial to give them an additional point from other graduates and secure their place on a job.

These activities have an impact on the outcome of the course because one of the objectives of this project is to identify the programming level of the students involved through problem-based tasks related to timing analysis on robot software, which is one of the main parts that is highly focused on their course. This is because the real-time software development process uses timing analysis to decide how each process involved in producing the desired output should be scheduled so that all systems can be produced in a timely way. Moreover, students could also understand more about how to make mobile robots work and operate well using Arduino. By getting these experiences, students could achieve the course's outcome better because they get to understand the subjects better through these hands-on activities.

Something impactful that I learned from the activities is how Information and Communication Technology ( ICT ) could have a big influence on revolving teaching and learning activities in this technological era that keeps developing rapidly. For example, the mobile robots used to encourage programming resilience skills among software engineering students are indeed a good approach because the young generation's students are more attracted to Competition-Based Learning activities than just learning from books and lectures. Besides, this method could also help them to know how to face real-time problems and use critical thinking skills to solve them efficiently.

The activities indeed spark excitement and interest in the students because they show how students can take advantage of technology in their studies to make it exciting yet meaningful. For instance, the mobile robots let students explore how each component and software used work together to perform their operation. By doing this, they'll not easily feel bored and will feel more connected to the activities and the learning materials. In fact, by exposing these mobile robots to the school's students, it indeed developed their interest in this field earlier, which could give them a clearer vision of what courses they should take to keep learning about them. Thus, Competition-Based Learning using mobile robots undoubtedly makes its application in teaching and learning more fascinating and engaging for them.

In my opinion, visiting NALI 2023 and the interview sessions did help me learn the course material better. This is because, through the NALI 2023 visit, I could attend various booths prepared by speakers from all over the country and increase my knowledge about the usage of ICT in teaching and learning activities for different courses. Other than that, I could also attend a keynote and plenary session about topics like computational thinking and resilient potential during the visit, which would give me more exposure to a real working environment. Besides, through the interview sessions, I could also learn the course material better because the interviewee has explained a lot about their project, which is related to ICT in teaching and learning. The interview session also made me amazed at how they started to approach school students about mobile robots to boost interest and attract them to learn more about the technology.

#### **4.3 UTM ECO MOBILE APP : BIODIVERSITY GEO-TAGGED ECOTOURISM EXPERIENCE ON UTM CAMPUS**

The UTM ECO mobile app is undoubtedly beneficial for students and educators. It provides a clearer image of resilience education, which is important for them to strengthen individual skills and develop resilience in daily life.

By using this application, students are able to promote innovative learning skills. At the same time, they can develop multiple learning modes and materials in order to improve the outcome, especially for the subject of ICT.

It is exciting to say that I have learned something impactful from the activity. This event broadens my view regarding the power of technology in teaching and learning aspect. After the interview session, I learned about the scene behind the development of this UTM ECO mobile app, including where the ideas of the developers came from and the obstacles they faced when developing this application.

In my point of view, the UTM ECO mobile app sparks interest among the students. Through this application, students are allowed to fully explore the biodiversity of UTM, which consists of many species of flora and fauna. In addition, they are able to use this app to obtain the details of specific animals or plants. Thus, it is really fun when students can learn more about the biodiversity of UTM while taking a walk around the campus.

I feel that the visit to NALI 2023 and the interview sessions helped me learn the course material better. Students are allowed to explore many kinds of technologies. Moreover, students are able to observe the demonstration of the developed technology from the participants or even have a hands-on opportunity. By exploring the technologies shown in the event, I can see how the theories learned in the course turn into applications in the area of education. Thus, I have a better understanding and a clearer image of the course materials.

#### **4.4 EQUINUTRICHECK : A COMPREHENSIVE HORSE NUTRITION SOLUTION**

This activity gives benefit to students by offering them a practical and user-friendly tool, which is an Excel workbook to calculate the nutrient intake for horses in their feed. By using Excel formulas to simplify the complex calculations involved in equine nutrition, it can easily enhance students' understanding of the subject. Students can now easily calculate and determine the nutrients that horses get without having to go through a manual calculation process. It also enables them to apply theoretical knowledge in real-world scenarios, for example, in their internship and when working at a stable, making their learning more practical and applicable.

Besides, this workbook significantly improves the course's outcome by providing a hands-on approach to learning. It uses ICT to offer a tool that simplifies and streamlines the calculation process and bridges the gap between theory and practice. It empowers students to grasp and master equine nutrition concepts more effectively, making the subject more accessible and relevant. Ultimately, it prepares students better for practical applications in equine-related fields.

From the workbook, I learned that ICT is important in teaching and learning for both students and lecturers. By applying technology to science, it can make people's work easier and more efficient. For example, by using the preset equations in the Excel workbook, we can get the specific and precise calculations for equine nutrition instantly without having to go through a long process of calculation.

The Excel workbook also serves as a tool that simplifies a complex process, making equine nutrition calculations easier for students. It is also relevant to their future careers, such as internships or working in stables, so it can spark excitement and interest for the future in students. It could motivate them to engage more actively with the subject they are learning, which is equine nutrition.

The visit to NALI 2023 and the interview sessions helped me learn the course materials better by learning more about the innovations in ICT that can potentially improve our education. I get to see the application of technology in teaching and learning with my own eyes and understand more about each of them through interviews with the NALI 2023 participants. Overall, visiting NALI 2023 has encouraged me to learn more about our course materials and helped me to grasp more knowledge about technology and information systems.

#### **4.5 PUZZLE GAME-BASED LEARNING AS A TOOLS TO ENHANCE STUDENTS PERFORMANCE**

The Puzzle Game-Based Learning activities have shown significant benefits for students. According to the survey mentioned in the poster, 80% of respondents reported an increase in knowledge after engaging in these activities. They can enhance engagement during class, as puzzle games are inherently interactive, involving students actively. They capture students' attention and interest, making the learning process more enjoyable. Additionally, it can enhance our memory retention. This is said to be so because the challenges presented in puzzle games, whether visual or logical, can contribute to improved memory retention. Therefore, students often remember concepts better when they actively apply them to solve problems.

These activities, especially when integrated into the course or subject, can have a significant impact on outcomes. Participating in puzzle game-based activities positively affects academic performance by improving critical thinking skills, memory retention, and concentration. Active engagement in these activities allows students to enhance their problem-solving abilities and gain a more comprehensive understanding of the course material. Consequently, students may achieve improved academic performance and a deeper understanding of the subject matter. Moreover, the enjoyable nature of puzzle games contributes to a positive learning environment, enhancing student motivation, participation, and overall satisfaction with the course.

From the Puzzle Game-based Learning activities, something impactful that I learned is learning experiences. The collaborative nature of these activities, conducted in group settings, has fostered effective communication and teamwork. This collaborative process not only enhances interpersonal skills but also introduces a healthy sense of competition, encouraging me to participate more actively in learning. For instance, solving complex puzzles required us to communicate ideas, share perspectives, and collectively strategize, enhancing our overall collaborative abilities. This mix of collaboration and competition has made my learning experiences more dynamic and engaging, contributing significantly to both my personal and academic growth.

The puzzle game-based learning activities have been effective in sparking excitement and interest among students. According to feedback from higher educational institution students, these activities were characterized as enjoyable and engaging. The dynamic and interactive nature of puzzle games, especially when conducted in group settings, fosters a sense of healthy competition and creates an intriguing learning environment. Students reported that the activities were easy to comprehend, contributing to sustained focus during the learning sessions. The positive responses indicate that the puzzle game-based learning approach successfully captures students' attention and maintains their alertness in the classroom. Overall, the activities have proven to be exciting and interesting for students, enriching their learning experience significantly.

In my opinion, I feel that visiting NALI 2023 and the interview sessions has significantly contributed to my understanding of the course material. This is attributed to the introduction of innovative teaching methods, such as puzzle game-based learning, programming resilience skills through competition-based learning using mobile robots, and more. By this, I can gain insights into the latest trends in Information and Communication Technology ( ICT ) education, gaining a deep understanding of innovations in the education sector. Also, I get the opportunity to experience various new educational technologies, enhancing my knowledge about their benefits. During the interview session, I can engage with the interviewee by learning from their successes and asking questions about the innovation. This helps me spark interest in this subject. Overall, visiting NALI 2023 provides me with a rich learning experience, enhancing my understanding of educational technology.

## **5.0 CONCLUSION**

In conclusion, the event of NALI 2023 is definitely beneficial to the students, especially to us who are taking the subject of Technology and Information System. This is because the visit allows us to conduct some interview sessions and interact with the participants, who develop technologies for the use of teaching and learning in various subjects. Through the sessions, we are able to know more and improve our understanding of the ideas and mindsets of the technology developers in doing their respective projects to give benefits to people.

During the event, we were also visiting lots of booths about Innovation and Communication Technology ( ICT ) in teaching and learning. The participants of each booth that we visited showed us how their technologies actually work in the area of education. Like all the innovations explained in this report, each of them was specified for a different field of study and had its own advantages for the innovations that they brought to reality. Besides them, there's also a booth that offers students the opportunity to experience a virtual reality simulation of designing a building. This activity gives an interesting experience, especially for architecture students, to try out what they have learned in the simulation and see the outcome on the spot. Moreover, virtual reality simulation has been very popular among students, which gives it an extra point of attraction.

In short, the time spent with all of the participants at NALI 2023 was indeed really worth and valuable. It's undoubtedly leaving us with a high interest in keeping learning and engaging with the technology that keeps evolving in the education area and others. We also hope that this kind of event will continue to be organized in the future, as it has numerous advantages, especially for students, to increase their understanding as well as awareness about the technology that they have been using in their everyday lives.