



اَبُو سَيِّدِي تَكْوَلُ لِي مَا اَنَا
UNIVERSITI
TEKNOLOGI
MARA



PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)



*"Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation"*

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Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students and get some ideas to develop future innovation products.

Foreword Rector



Assalamualaikum warahmatullahi Wabarakatuh,
Salam Sejahtera, Salam Malaysia MADANI and
Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most
Merciful.

It is a great honor to welcome you to the Johor
International Innovation, Invention, Competition, and
Symposium 2024 (JIIICaS 2024). This event

connects various disciplines, focusing on education and engaging educators,
students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and
determination to turn those ideas into reality. The remarkable projects
showcased today highlight the dedication and spirit of all participants.
Initiatives like this not only explore new technologies but also cultivate skills
and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor
Branch, we are fully committed to fostering a dynamic culture of innovation,
promoting the commercialization of new products, and encouraging
meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all
sponsors, judges, the College of Computing, Informatics and Mathematics,
UiTM Pasir Gudang Campus as the event organizer, as well as to the
researchers and participants for their hard work in making this event a
success. Let us continue striving for innovation and excellence. May the
ideas presented today inspire us and lay the groundwork for future
achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

(A-ST077) OPTIMIZING STUDENT SELECTION FOR SBP MALAYSIA VIA FUZZY LOGIC

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ABSTRACT

This study investigates the manual system used by the evaluators for selecting the student for SBP (Sekolah Berasrama Penuh) programmed. Understanding the current selection process is important for finding inefficiencies and opportunities to improve. A qualitative approach was adopted, involving interviews with evaluators and an analysis of the selection criteria and methods applied during the selection process. The findings reveal several limitations in the manual system, including potential biases, inconsistency in evaluations, and time-consuming procedures. The study concludes with recommendations for implementing a more systematic and automated selection process to enhance fairness, accuracy, and efficiency in selecting students for the SBP program. A fuzzy logic system has been proposed to be used as tools for the student's selection process.

Keywords: fuzzy logic, SBP, decision making

1.0 INTRODUCTION

Malaysia's Sekolah Berasrama Penuh (SBP) is a prestigious educational system focused on academic excellence and holistic development. It offers programmed for selected students from across the country, implementing values such as critical thinking, creativity, problem-solving, leadership, and other 21st-century abilities. However, the manual evaluation for the student's selection for this program is very outdated, included with biases and has several limitations that undermine its effectiveness which may result in inaccurate placement of students. These problems show that, to guarantee that the worthiest students are selected for the SBP program, a more dependable, effective, and impartial selection process is required.

Therefore, a fuzzy logic system has been proposed to be used as a tool for the student's selection process. The suggested innovation is an automated selection process that assesses student applications by utilizing cutting-edge technology like data analytics and machine learning. The objectives of this system are to simplify the evaluation process, lessen human bias, increase the effectiveness and timeliness and standardize the selection criteria. Through the integration of a comprehensive

evaluation framework that considers an applicant's co-curricular accomplishments, leadership abilities, and academic performance, the automated system will guarantee an impartial and thorough assessment of every candidate. To guarantee the program finds and nurtures the best talent in the country, the ultimate objective is to improve the quality and equity of the SBP selection process.

2.0 OBJECTIVE

1. To provide standards inside the fuzzy logic framework based on characteristics such as academic performance, extracurricular activities, and leadership abilities, standards should be created within a fuzzy logic framework.
2. To increase the effectiveness and timeliness of the SBP program's student selection procedure in Malaysia by substituting an automated fuzzy logic-based solution for manual evaluation.

3.0 METHODOLOGY

In this section, the methodology process includes several crucial stages, including planning, data collection, system design, development, testing, and implementation. The process starts with the identification of the criteria of the students that need to be selected before it can be implemented in the fuzzy logic system. As for the system created, there are three important criteria that need to be highlighted which are 'academic performance', 'leadership' and 'co-curricular activities'. The system utilizes the inputs and generates outcomes immediately whereas for the output, there are three outcomes which are "Accepted", "To be Considered" or "Dismissed". Each stage is important to guarantee the system's efficacy, dependability, and efficiency. The table below shows the implementation of Fuzzy Logic Controller for the system.

Next, the fuzzification technique is important in fuzzy logic systems because it changes specific external input data into meaningful, linguistically fuzzy information. This change is accomplished through an attribution function, which acts as the main mapping medium. As Chuang (2020) points out, selecting a suitable fuzzifier is critical to ensure the efficiency and correctness of the following calculations done within the fuzzy inference engine. The right fuzzifier simplifies these calculations and improves the overall performance of the fuzzy logic system. By precisely capturing the inherent vagueness and ambiguity of real-world settings, an optimal fuzzifier allows the system to handle imprecise inputs more successfully, improving decision-making processes.

4.0 RESULTS

The SBP program's automated selection mechanism has several benefits and notable effects, demonstrating its innovative and distinctive approach and methodology. As for the advantages of the fuzzy logic system created, it can increase fairness and minimize human biases by standardizing the criteria that the students need to have to be selected in the SBP Program. The second advantage of the system is it can provide transparency where a clear and consistent criteria and scoring system has been explained to the potential candidates, making it easier for them to understand the evaluation process. Therefore, by implementing this system into the student evaluation process, higher quality students will be selected for the SBP Program, ensuring only the most deserving and capable students are selected. This can be beneficial as it will lead to a higher academic performance and high-quality achievements can be made within the SBP Program.

5.0 CONCLUSION

In conclusion, the current manual selection system for the SBP program is full of inefficiencies, biases, and inaccuracies. These difficulties highlight the need for a creative selection method that uses innovative technologies to standardize and improve the selection procedure. By implementing an automated system, the SBP program can guarantee that the most deserving candidates are fairly and accurately identified. This will improve the program's capacity to identify and develop Malaysia's best potential talent.