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“Optimizing Innovation in Knowledge, Education and Design”

EXTENDED ABSTRACT



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Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH



WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail

Chair

3rd International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)

EASY WAY TO WRITE A CLEAR RESEARCH PROBLEM STATEMENT USING IRCA MODEL: IDEALLY, REALITY, CONSEQUENCES AND AIM

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ABSTRACT

A research problem statement serves as the heart of a research endeavor. However, many authors, especially academicians, students, and postgraduates, frequently struggle to articulate a clear problem statement. As a result, they are not clear on the direction of their own research. The IRCA Model is suggested as a useful tool to help authors develop a clear problem statement in order to address this problem. IRCA stands for "Ideally, Reality, Consequences, and Aim," which are the four major themes. By including these four major themes, researchers can effectively write a clear problem statement.

Keywords: problem statement, ideally, reality, consequences, aim

INTRODUCTION

A research problem statement is an explanation of the problem that needs to be investigated. It enables the reader to comprehend the objective and purpose of the research quickly (Elsevier, n.d.). It essentially explains the gap and the goal of the study; examples of gaps include those in methodology, sampling, variables, and other areas.

Moreover, a research problem statement is a concise and clear description of the specific issue or challenge that a research study aims to address (Smith & Johnson, 2018). It provides context by highlighting what is already known about the problem, presents the significance and relevance of the issue, and outlines the scope of the research. The statement defines the problem in a way that allows systematic study and proposes potential solutions or avenues for further investigation (Sekaran, 2003).

A clear research problem statement is essential for guiding the research process and communicating the purpose and focus of the study to both experts and non-experts (Jones et al., 2020). However, writing a clear problem statement in a study is challenging. Research, by its very nature, is a demanding task that necessitates profound subject knowledge, meticulous planning, and hard work.

Qasem and Zayid's (2019) research highlights that students encounter numerous challenges and difficulties when composing research proposals and projects, with one of them being the selection of an appropriate topic.

Failing to choose an appropriate topic could suggest that a student struggles in identifying the issues associated with a specific subject, potentially leading to an inadequate explanation of the problem statement. A well-constructed problem statement should effectively outline the research's objective. Nonetheless, when a researcher fails in writing a clear problem statement, the reader might struggle to understand the research's focus. Therefore, this paper aims to introduce a novel approach using IRCA model to facilitate the writing of a clear problem statement.

2 HOW TO WRITE A RESEARCH PROBLEM STATEMENT USING IRCA MODEL.

2.1 This section provides guidance on writing a clear problem statement by using IRCA model. Table 1 presents the description of the four major themes involved in writing a clear research problem statement, namely: Ideally, Reality, Consequences, and Aim (IRCA).

Table 1: IRCA Model

Themes	Description
Ideally	The researcher needs to describe what is considered an ideal situation in the context of their study/topic.

Reality	The researcher needs to demonstrate how the ideal situation contradicts with the real situation.
Consequences	The researcher needs to demonstrate the negative consequences of such a contradiction between the ideal situation and reality.
Aim	The researcher needs to articulate the intention or aim of the study.

2.2 This section will give some examples of how to use IRCA model in writing a problem statement. Tables 2, 3, and 4 demonstrate a simple example of how these themes can be applied to write a clear problem statement.

Table 2: Losing weight.

Themes	Description
Ideally	Ideally, a person who exercises regularly will lose more weight.
Reality	The reality is that many who exercise regularly still fail to lose weight.
Consequences	Consequently, many give up exercising and become overweight.
Aim	The aim of the study is to explore why some people who exercise regularly still fail to lose their weight.

Table 3: High Cholesterol

Themes	Description
Ideally	Ideally, a person who is not overweight has a lower cholesterol level.
Reality	The reality is that many people who are not overweight are found to have a higher cholesterol level.
Consequences	Consequently, many people may not be motivated to monitor their body weight.
Aim	The aim of the study is to explore why people who are not overweight still have high cholesterol levels.

Table 4: Unemployed

Themes	Description
Ideally	Ideally, people who have a degree may have higher chances of getting a job.
Reality	The reality is that many people who have a degree are still unemployed.
Consequences	Consequently, many people may not be motivated to further their studies to a degree level.
Aim	The study aims to explore why people with a degree are still unemployed.

2.2 A more concrete example of how to write a problem statement using IRCA is provided in this section. Practical examples for creating a problem statement from a variety of topics and fields are provided in Tables 5, 6, 7, 8, and 9. This section also attempts to demonstrate that anyone can use the IRCA model, regardless of their field of study.

Table 5: Towards Sustainable Solutions: Addressing Challenges in Plastic Waste Management

Themes	Description
Ideally	Ideally, the use and management of plastic materials should align with sustainable practices, minimizing plastic waste generation, promoting circularity, and preventing environmental harm (Smith et al., 2020). In an ideal scenario, plastic products would be designed for reusability, recycling, or safe degradation, while consumption patterns would prioritize reduction and responsible disposal.
Reality	However, in reality, the management of plastic waste poses significant challenges that deviate from these ideals (Jones & Brown, 2019). Rampant plastic consumption, limited recycling infrastructure, inadequate public awareness, and the persistence of single-use plastics contribute to a widespread plastic pollution crisis. Despite growing recognition of the need to address plastic waste, current systems fall short of effectively mitigating its environmental impact.
Consequences	The consequences of these challenges are far-reaching and severe. Plastic pollution affects ecosystems, contaminates water bodies, endangers wildlife, and enters the food chain, posing risks to human health (Thompson et al., 2021). Inefficient plastic

	waste management results in resource depletion, elevated energy consumption, and increased landfill and incineration rates. The lack of effective solutions perpetuates the cycle of plastic pollution, exacerbating global environmental challenges.
Aim	The aim of this study is to examine the challenges of implementing a more sustainable practice of managing plastic waste (Brown et al., 2022).

Table 6: Intra-Ethnic Competitions Among the Kadazandusun in Sabah

Themes	Description
Ideally	Ideally, the Kadazandusun community in Sabah should exemplify a harmonious and united entity, where individuals collaborate based on their shared ancestry and cultural heritage (Smith & Lim, 2018). Economic, political, and social disparities should be minimized, and the community should serve as a model of cohesion within the diverse Sabah region.
Reality	However, the Kadazandusun community is experiencing an increase in intra-ethnic competitions, characterized by economic disparities, political divisions, historical grievances, and cultural differences (Tanaka et al., 2020). These competitions manifest in various aspects of life, including social interactions, economic opportunities, educational pursuits, and community development. Such tensions hinder the community's ability to address shared challenges and harness collective strengths.
Consequences	The consequences of these intra-ethnic competitions are significant. Social cohesion is eroded, economic growth is hindered, and the community's ability to participate effectively in regional and national affairs is compromised (Ghazali & Ramli, 2019). External investments might be discouraged, and the perpetuation of mistrust and hostility threatens long-term sustainability. The overall unity of the Kadazandusun community is at risk, along with its potential contributions to Sabah's progress.
Aim	To address this issue, the aim is to thoroughly understand the root causes of intra-ethnic competitions among the Kadazandusun community (Ooi, 2017).

Table 7: Navigating the Nexus: Unravelling the Dynamics Between Economic Growth and Poverty in Sabah, Malaysia

Themes	Description
Ideally	Economic growth ought to be associated with significant poverty reduction, resulting in an equal distribution of wealth

	and improved living conditions for all sectors of the population in Sabah, Malaysia.
Reality	However, despite Sabah's economic success, based on a recent study by Yassin <i>et al.</i> , (2022) a considerable percentage of the population remains impoverished and struggles to acquire basic necessities and possibilities for upward mobility.
Consequences	As a result of the current gap between the ideal and reality, prolonged poverty in Sabah, despite economic growth, can lead to social inequality, limited access to education and healthcare, increasing social conflicts, and lower overall human development.
Aim	The aim is to thoroughly investigate the relationship between economic progress and poverty in Sabah. This entails completing a thorough examination of economic indicators, poverty statistics, employment trends, and social development variables. The findings will be used to inform evidence-based policies and initiatives aiming at closing the gap between economic growth and poverty reduction in Sabah, ultimately leading to a more inclusive and prosperous society.

Table 8: Potential applications of bacteria for bioremediation

Ideally	Bioremediation could rapidly and completely degrade a wide range of pollutants, leading to efficient and sustainable environmental cleanup (Bala, 2022). Bacteria used in bioremediation processes have the ability to effectively detoxify heavy metals and organic pollutants, without generating harmful by products (Kapahi & Sachdeva, 2019; Saravanan et al., 2023)
Reality	The effectiveness of bacterial bioremediation varies based on the type of pollutants and environmental conditions, often leading to incomplete degradation and limited success (Jabbar et al., 2022)
Consequences	As a consequence of this limitation, contaminated sites remain hazardous, ecosystems continue to suffer, and traditional cleanup methods can be costly and environmentally disruptive. (Jabbar et al., 2022)
Aim	The aim of this study is to enhance the efficiency and reliability of bacterial bioremediation by investigating novel bacterial strains, optimizing environmental conditions, and developing strategies to enhance pollutant degradation rates, ultimately leading to more effective and eco-friendly cleanup solutions.

Table 9: Assessing the Impact of NPK Fertilizer Application on Oil Palm Plantations

Ideally	Applying an average NPK fertilizer onto an oil palm plantation
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	will lead to an optimal increase in yield.
Reality	However, in reality, the effectiveness of NPK fertilizer application on yield can be influenced by various factors, including soil quality, weather conditions, and management practices.
Consequences	The mismatch between the ideal expectation and the unpredictable outcomes can result in inconsistent yield improvements and potential financial losses for farmers.
Aim	his study aims to empirically assess the impact of applying average NPK fertilizer on oil palm plantations, identify factors contributing to variations in yield response, and provide evidence-based recommendations to optimize yield enhancement strategies

CONCLUSIONS

Having a clear research problem statement is important, as it will set a clear direction of a research. By using IRCA (Ideally, Reality, Consequences, and Aim) model, it will provide researchers with a more organised and clearer guideline for formulating a clear research problem statement.

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