



PAPER WRITING COMPETITION

Guide to Form a Research Problem Statement

Module 3

*By,
Association of Science, Technology and
Innovation*

Introduction

Many scientific articles being sent for publications are absent of a problem statement or they are incomplete. Authors are often confused between the purpose of a research exercise or experiment (*aka* aim of the experiment) and the problem statement.

What is a problem statement? Does a study objective, hypothesis, or summary of the content of the report comprise a problem statement?¹

The Problem Statement is also called by other “names” *e.g.* some people call it the Research Question. However, they all refer to generally the same thing. Let’s do some exercise to learn how to form a problem statement.

This module is aimed to:

- a. provide an understanding on what a problem statement is.
- b. provide some basic knowledge on how to write a clear, concise, and complete problem statement

Consider an example here:

Chee Kit is a non-native English-speaking student in grade 2. When Chee Kit encountered difficulties with word problems in mathematics, his class teacher thought that he has not mastered the basic mathematic skills that would allow him to solve the question. However, the difficulty may lie in poor reading skills, which prevented him from identifying the words in math problems.

Identify what is the problem here?

What Is a Problem statement?

This is an area of conflict, concern, or controversy (a gap between what is known, what is observed and what is to be achieved). Hence research problem is the area a researcher would like to address, investigate, or study, whether descriptively or experimentally on a shortcoming that he or she had observed previously and come up with unique solution. A well-defined and a structured research problem is the heart of the research project and on the other hand a vague research problem is the weakest point in a research. One way to identify the research problem is via comprehensive literature search.

Research problem statements are therefore, must be:

- a clear statement that the problem exists (from observation)
- evidence that supports the existence of the problem (from literature review), or
- evidence of an existing trend that has led to the problem (from literature review)
- a specific and feasible statement of solution (how does the current proposed study/ methodology may solve the existing problem)

How to write a clear, concise and complete Problem statement?

There are many ways a problem statement can be derived and constructed, however a simple and constructive method is shown here:

- I. Identify what is the issue
- II. Identify the community it affects
- III. Identify the impact of the issue to the community
- IV. Identify how does your proposed study/ methodology can solve the issue.

Phrases to use for

a. "Identifying what is the issue", *e.g.*

- There is lack of ...
- There is absence of ...
- Difficulties in doing ...
- Major problem with this kind of application is...
- Despite its safety and efficacy, _____ suffers from several major drawback...
- There is increasing concern that _____ are being disadvantaged...

b. "Identifying the community it affects" *e.g.*

- amongst the young people ...
- for the Malaysian community ...
- as research has consistently shown that these students lack...
- as this may impact the drivers...
- among the dogs in....
- by Chee Kit...

c. "Identifying the impact of the issue to the community' *e.g.*

- which resulting in ...
- which causing/ causes...
- that yield...
- has resulted into...
- this enables...
- which makes the....

d. 'Identifying how your proposed study/ methodology can solve the issue' *e.g.*

- Hence, this study is aimed to ...
- Therefore, the proposed study enables...

How to construct a Problem Statement

Phrases to use for “Identifying what is the issue’	Phrases to use for “Identifying the community it affects’	Phrases to use for “Identifying the impact of the issue to the community’
There is lack of ...	amongst the young people ...	which resulting in ...
There is absence of ...	for the Malaysian community ...	which causing/ causes...
Difficulties in doing ...	as research has consistently shown that these students lack...	that yield...
Major problem with this kind of application is...	as this may impact the drivers...	has resulted into...
Despite its safety and efficacy, _____ suffers from several major drawback...	among the dogs in....	this enables...
There is increasing concern that _____ are being disadvantaged...	by Chee Kit...	which makes the....

Phrases to use for ‘Identifying how your proposed study/ methodology can solve the issue’

this study is aimed to ...

therefore, the proposed study enables...

Exercise 1

Chee Kit is a non-native English-speaking student of grade 2. When Chee Kit encountered difficulties with word problems in mathematics, his class teacher thought that he has not mastered the basic skills that would allow him to solve the question. However, the difficulty may lie in poor reading skills, which prevents him from identifying the words in math problems.

Write a clear, concise and complete problem statement for above paragraph.

1	Identify what is the issue
2	Identify the community it affects
3	Identify the impact of the issue to the community
4	Identify how does your proposed study/ methodology can solve the issue

Exercise 2

Approximately 48 people who had consumed street foods from a nearby night market in Kota Bharu has been admitted to hospital after they complained of diarrhea, nausea and muscle cramps. Initial reports indicated that the food might be contaminated with *Salmonella* spp.; a pathogenic strain which causes foodborne disease worldwide. Statistics has indicated that there is an increasing trend in the foodborne diseases among Malaysians due to the consumption of street foods. Even though there are laws and regulations in place, some food traders lack knowledge and attitude towards hygienic food preparation practice and this is seen as one of the main reasons for the increasing cases of *salmonellosis*.

Write a clear, concise and complete problem statement for above paragraph.

1	Identify what is the issue
2	Identify the community it affects
3	Identify the impact of the issue to the community
4	Identify how does your proposed study/ methodology can solve the issue

Exercise 3

Food waste is recognized to be a huge problem worldwide and is particularly severe in developed countries. For examples, in the United States, food waste and losses at the retail and consumer levels have amounted to 188 kg per capita per year, or an overall value of \$165.6 billion. Among Europe and the North America, the food waste was estimated as high as 280 – 300 kg per capita per year. In Southeast Asia, it is estimated that 33% of food is wasted in the region. It was reported that on average a household in Malaysia throws away around 0.5 - 0.8 kg uneaten food per day².

Write a clear, concise and complete problem statement for above paragraph.

1	Identify what is the issue
2	Identify the community it affects
3	Identify the impact of the issue to the community
4	Identify how does your proposed study/ methodology can solve the issue

Exercise 4

Vector control strategies have traditionally focused on killing mosquitoes using a variety of insecticides. Environmental management (through reduction or removal of mosquito breeding sites) has often been used alongside chemical or microbiological ovicides, larvicides, and pupicides in areas where endemic mosquito-borne diseases occur. The use of synthetic insecticides must be regulated given that the development of insecticide resistance is widespread and that there is concern regarding the damage to the environment and effects on non-target organisms. Besides, there is a growing need for novel, cheap, and reliable mosquito control strategies. In many countries where mosquito-borne diseases are endemic, the financial burden of insecticide-based vector control programs is also prohibitive to widespread use. Environmentally friendly alternatives have been explored to help reduce the selection pressure for insecticide resistance³.

Write a clear, concise and complete problem statement for above paragraph.

1	Identify what is the issue
2	Identify the community it affects
3	Identify the impact of the issue to the community
4	Identify how does your proposed study/ methodology can solve the issue

Exercise 5

Rice is the major staple food for hundreds of millions of people. It is generally consumed in its milled form with outer layers (pericarp, tegmen and aleurone layers) removed. The main reason for milling is to remove the oil-rich aleurone layer, which turns rancid upon storage, especially in tropical and subtropical areas. As a result, the edible part of rice grains consists of the endosperm, filled with starch granules and protein bodies, but it lacks several essential nutrients for the maintenance of health, such as carotenoids exhibiting provitamin A-activity. Thus, reliance on rice as a primary food staple contributes to vitamin A deficiency, a serious public health problem in at least 26 countries including highly populated areas of Asia, Africa and Latin America⁴.

Write a clear, concise and complete problem statement for above paragraph.

1	Identify what is the issue
2	Identify the community it affects
3	Identify the impact of the issue to the community
4	Identify how does your proposed study/ methodology can solve the issue

Why do you need to state problem statement in your study?

- It establishes the importance of the topic.
- It creates an interest.
- It helps the researcher focus his/ her study scope and helps to determine its parameters.
- It focuses both the investigator and reader's attention on how the study will add to the existing literature of knowledge.

Sample Answers

Below are sample answers. You may find different answers which are also valid. Remember that is problem statement which forms the basis of your hypotheses, which you will have to proof or disproof from your investigation.

Exercise 1

1	<i>Identify what is the issue</i>
	Not able to master the language/ poor reading skills
2	<i>Identify the community it affects</i>
	Chee Kit
3	<i>Identify the impact of the issue to the community</i>
	Not able to solve word math questions
4	<i>Identify how does your proposed study/ methodology can solve the issue</i>
	Extra language classes after schooling hours

Clear, concise and complete problem statement

The lack of English language proficiency and reading skills in Chee Kit yields him poor grades when comes to answering Math word questions. Hence, extra language and reading classes after schooling hours will enable Chee Kit to improve his reading skills and this will earn him better grades in Math word questions.

Exercise 2

1	Identify what is the issue
	Street food traders are lack of knowledge and attitude towards hygienic food preparation practice.
2	Identify the community it affects
	Among street food consumers
3	Identify the impact of the issue to the community
	increased cases of salmonellosis
4	Identify how does your proposed study/ methodology can solve the issue
	Hence a public survey on knowledge, attitude and hygienic practice among food traders will help to design better enforcement plan

Clear, concise and complete problem statement

Knowledge and attitude towards hygienic food preparation practice among street food traders are lacking. This results in the spread of foodborne diseases among street food consumers when foods being traded are contaminated by pathogenic Salmonella strains. Therefore, the present survey-based study will enable a comprehensive understanding on the level of Knowledge, attitude and hygienic practice among food traders in night market as this data will be useful in designing a strategic enforcement plan for street food trade regulations.

Exercise 3

1	Identify what is the issue
	There is a major problem with food mismanagement and wastage worldwide
2	Identify the community it affects
	Among of developing countries
3	Identify the impact of the issue to the community
	Which reflecting huge lost in term of resources and money
4	Identify how does your proposed study/ methodology can solve the issue
	Genetically modified bacteria can be used to decompose organic waste and the generated methane gas can be used as cooking gas.

Clear, concise and complete problem statement

There is a major problem with food mismanagement and wastage among developing countries worldwide which incurs huge lost in term of resources and billions of dollars. The proposed study is therefore aimed to reduce food mismanagement where the genetically modified bacteria used in this study able to decompose organic waste. Besides, the methane gas generated as a by-product in the decomposing process can be used as cooking gas.

Exercise 4

1	Identify what is the issue
	Problem with the use of synthetic insecticides is the development of insecticide resistance mosquito species besides the rising cost of insecticides.
2	Identify the community it affects
	Countries with endemic mosquito-borne diseases and economically burdened countries
3	Identify the impact of the issue to the community
	This results in mosquitos which are not easily killed as they develop resistance towards insecticides. Besides that, the ban in the usage of insecticides by economically burdened countries further hampers the notion taken to curb mosquito-borne diseases.
4	Identify how does your proposed study/ methodology can solve the issue
	Hence, the biological method of raring fishes in the pond may prevent the spread of mosquito and subsequently reduces the usage of insecticides. Besides, this method is also economical and does not burden financially.

Clear, concise and complete problem statement

There is a serious problem with the use of synthetic insecticides which may give rise to the development of insecticide resistance among mosquito species. These mosquitos are therefore not easily killed and may reproduce uncontrollably in endemic countries. Besides, the ban in the usage of insecticides by economically burdened countries further hampers the notion taken to reduce the spread of mosquito-borne diseases in persistent countries. Hence, the biological-control suggested in this study may prevent the spread of mosquito and subsequently reduces the usage of insecticides. Besides that, this method is also economical and does not incur extra financially load.

Exercise 5

1	Identify what is the issue
	Removal of the pericarp, tegmen and aleurone layers of rice yields lack carotenoids and subsequently contributes to vitamin A deficiency.
2	Identify the community it affects
	At least 26 countries of Asia, Africa and Latin America
3	Identify the impact of the issue to the community
	Serious public health problem due to the lack of vitamin A and malnutrition
4	Identify how does your proposed study/ methodology can solve the issue
	Genetically modified “Golden rice” that is proposed in this study are therefore able to fulfill sufficient daily nutrient intake requirement of vitamin A.

Clear, concise and complete problem statement

The removal of the pericarp, tegmen and aleurone layers of rice resulted in lack of carotenoids activity in rice and has subsequently contributed to vitamin A deficiency in many countries of Asia, Africa and Latin America where rice is their main staple food. Vitamin A deficiency may sustain serious public health problem due to malnutrition. Therefore, the proposed study is aimed to study the feasibility of introducing a genetically modified “Golden rice” that is purposed to feed sufficient daily nutrient intake requirement of vitamin A for people identified with such malnutrition in Asia.

References

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No 16A, Jalan 21/12, Sea Park,
46300 Petaling Jaya,
Selangor Darul Ehsan.

Tel : 03-78778571/78655557

Fax : 03-78729551

E-Mail : yijasti@gmail.com

Web :www.asti.org.my