

THE PROJECT AS A VEHICLE FOR PROBLEM SOLVING

Getting started

The term 'project' is used in a variety of ways both within the formal education sector and in the wider society. In everyday life, we often use the term to refer to an activity that we have decided to engage in, either because we think that it will be of benefit to a specific group, or alternatively because we derive personal pleasure from it.

Projects are also a feature of the workplace as more and more these days, staff are being encouraged or even required to form themselves into teams to undertake special assignments.

Then there is the formal teaching-learning environment. Project work constitutes one dimension of the overall teaching-learning strategy of an educational institution. It may be incorporated in a course of study, or it may be a stand-alone activity. However, even in formal education, not all projects are of the same type. Further, not all may be aligned to the formal curriculum.

Our focus in this course is on the project that forms part of the formal study programme that students pursue. Further, we are looking at it exclusively as an activity to be used for addressing real-world problems.

Consequently, we first need to differentiate our view of a project from others that are also in use. Thereafter, we will go into more detail about the problem-solving feature that we are highlighting.

Learning Objectives

- ❖ *Differentiate the project as a problem-solving tool from other types of projects.*
- ❖ *Identify and describe the key attributes of the problem-solving approach to project work.*
- ❖ *Clarify your understanding of the term 'problem' and identify other terms that share a similar meaning.*
- ❖ *Differentiate between everyday understandings of problem-solving and those that apply in the project-work context.*
- ❖ *Convert your initial problem idea into a question.*
- ❖ *Use the question to build the problem statement.*
- ❖ *Identify and describe the key features of the problem statement.*
- ❖ *Generate the project objective and establish its relationship with the initial question and the problem statement.*

1.1 Distinguishing among different types of projects

Four different types of projects come to mind, one from everyday usage, one from the field of project management and two others that are typically associated with teaching and learning in the formal education sector.

1.1.1 Everyday projects

We are referring to these as projects as distinct from ongoing tasks that are a part of the routine of everyday living. They are projects because they are based on a plan to achieve a clearly defined outcome, very likely within a particular time frame. Examples of such projects include

- running the football competition,
- organising a community clean-up campaign or
- planting a vegetable garden in your own backyard.

Almost invariably in these situations, the project is presented as something that has already been thought out and decided on. There may or may not be some rationale behind the decision, but if so, that is not usually highlighted. All of the focus is on the task to be accomplished and the need to harness all the necessary resources to get it done.

1.1.2 Projects implemented under project management umbrella

Some of you may be familiar with the use of the term 'project' in the field of project management. In that profession, there are certain clear attributes that define what a project is. For example,

- It is a series of related jobs or tasks, carried out in an organised manner to achieve a single objective or a single set of objectives
- It has a definite starting point and a definite completion time schedule; it is therefore a temporary activity.
- Its execution is subject to time, cost and other constraints: the resources available for implementing the project are always limited.

In that regard, project management is the process of planning, organising, controlling and measuring a project so that it could achieve its predetermined set of objectives.

Because of its significance in various professional management fields, project management has emerged as an important discipline in its own right within the formal tertiary education sector; it is a specialised area of study aimed at training people to enter the field. Some of you may be pursuing such courses and would therefore be undertaking projects in accordance with the principles and procedures of project management. Thus, even though you may detect similarities with other learning activities bearing the name 'project', you are required to adhere strictly to the requirements of the discipline.

1.1.3 Two types of education-related projects not dealing with problem-solving

Are you currently studying project management? Have you done any projects in that area of study? Have you done projects in other courses? In what ways are they similar or different from the ones you have done in your project management programme?



You will recall that we listed four terms that we will be using interchangeably in this course to refer to a project. They are *project*, *project activity*, *project work* and *project-based learning*. We further indicated that, regardless of the label used, all four share a focus on problem-solving aspect. That understanding still applies. However, there is an additional feature to the last of the four, *project-based learning*, that we must highlight.

Project-based learning (PBL) is the most recently coined term. While most educators who use the term view problem-solving as its primary purpose, there are a few that include other project-types under the umbrella of project-based learning. For example, Larmer (2014, updated 2015) views PBL as encompassing all three types of activities listed below:

- Designing and/or creating a tangible product, performance or event.
- Solving a real-world problem
- Investigating a topic or issue to develop an answer to an open-ended question.

In this course, we are joining with those theorists who keep the focus of PBL on problem-solving only. As such, we are excluding the other two. Let us briefly examine each of these to be clear about what exactly is being excluded.

1.1.3.1 Designing a tangible product

In the first of Larmer's types, students are required to apply certain principles and procedures in order to create something tangible. Such projects are typically associated with science-based or engineering courses. The intention of such projects is to determine how well you have learnt relevant theoretical knowledge and more importantly how well you are able to apply that knowledge in order to create a pre-determined product. Conversely, the project may be intended to demonstrate whether, through the creation or construction of the product, you are able to identify the principles inherent in its design.

An example of this type of project was demonstrated in the Secondary Schools Annual Design and Build Competition held in Trinidad and Tobago, at the St. Augustine campus of the University of the West Indies (UWI) in January, 2019. This competition was a collaborative effort of the Institute of Structural Engineers (Caribbean Regional Group), the Association of Professional Engineers of Trinidad and Tobago and the UWI. Participants were required to design and build a model structure strong enough to withstand natural forces. View the media resource on the course page then attempt the SAE that follows. Even though we are not dealing with this type of project, doing the exercise should be beneficial.

RESOURCE MATERIAL 1.1

TTT Live Online. Design and Build Competition, University of the West Indies (UWI) St. Augustine, Trinidad and Tobago, January 26, 2019.

SELF-ASSESSMENT EXERCISE 1.1

In two or three sentences describe the task participants were required to undertake and the objective they were expected to achieve. As far as you are able to discern from this short video clip, (or from your own knowledge) were there any particular principles and/or concepts that participants were expected to be aware of as they undertook the task?

1.1.3.2 Investigating an open-ended topic or issue

The third of Larmer's types can also be described as an extended essay or assignment. It is based on a topic or an issue of a fairly complex nature that requires thorough, comprehensive treatment. One important feature of such a project is that the topic is fairly open-ended, thereby giving students a certain degree of freedom to determine how they would approach the task. Students are also required to do extensive research covering a wide body of literature ranging from the theoretical to more popular, everyday information sources. The literature search would be guided by a clear analysis of the topic, to identify subtopics and establish the relationships among them. Given the scope of the assignment, it can be expected to be between 5,000 and 10,000 words in length. Following is an example of a topic for this type of project:

In the preamble of its 2001 Human Development Report, the United Nations Development Programme (UNDP) asserts, "throughout history, technology has been a powerful tool for human development and poverty reduction". Critique this assertion with reference to any geographical region (or sub-region) of the world.

Again, even though this type of project is excluded from the course, it may be useful to attempt the SAE below.

SELF-ASSESSMENT EXERCISE 1.2

Without getting too deeply into the topic, list some subtopics that you will use to do your planning as well as conduct your literature search if you were required to undertake this assignment.

We have identified these four types of projects to ensure that you are able to set them aside as we embark on the type we will be focusing on in the rest of this course, and

which we view as being sufficiently different in terms of its purpose to warrant its own treatment.

1.2 Project work as problem-solving: what the theorists say

Several theorists and practitioners concur that the primary purpose of project work is to engage students in the task of solving problems, and more specifically real-world problems.

Helle, Tynjola and Olkinuora (2006), drawing on the work of an earlier theorist, state, “projects involve the solution of a problem; often, though not necessarily, set by the student himself [or herself]” (p. 288). Taking the definition further, and using the more focused term, *project-based learning (PBL)*, the authors add, “the most distinctive feature of project-based learning is problem orientation, that is, the idea that a problem or question serves to drive learning activities” (p. 290).

Another theorist, Thomas (2000) emphasizes the real-life dimension of the problem-solving activity when he asserts, “PBL incorporates real-life challenges where the focus is on authentic (not simulated) problems or questions and where solutions have the potential to be implemented” (p.4). The term ‘authentic’ holds special significance here as it underscores the role that projects play in taking students beyond the structured, well-planned learning experiences of the classroom, into the real world in order to treat with problems as they actually exist and are experienced in the spaces within which they emerged.

However, even as he highlights the focus on authentic real-world problems, Thomas also recognises the role of theoretical knowledge in project-based learning. Citing earlier theorists, he makes the point that projects must be “crafted in order to make a connection between activities and the underlying conceptual knowledge that one might hope to foster” (p.3). His overarching position is, “PBL projects are focused on questions or problems that ‘drive’ students to encounter (and struggle with) the central concepts and principles of a discipline” (p. 3).

Two points are to be noted about the above. The first is the idea of the problem ‘driving’ the learning activities. The term ‘drive’ is significant as it moves the act of learning out of the realm of students simply reproducing information that was previously learnt to one where they must actively engage with the problem and allow their learning to emerge out of the encounter with it.

The second is that PBL seeks to achieve its goal of understanding and finding solutions to problems by looking at them through the lenses of the theoretical knowledge that professionals develop over time based on their study the real-world. Recall Thomas’ (2000) assertion that problems drive students to encounter ‘central concepts, themes and principles of the academic discipline’. One of the key challenges of undertaking a project activity is for the students to be able to illuminate the study of the real-world issue through reference to a formal body of knowledge. Failure to do so can result in students reproducing their own (often limited) awareness of the problem, thus restricting their ability to examine it in sufficient breadth and depth.

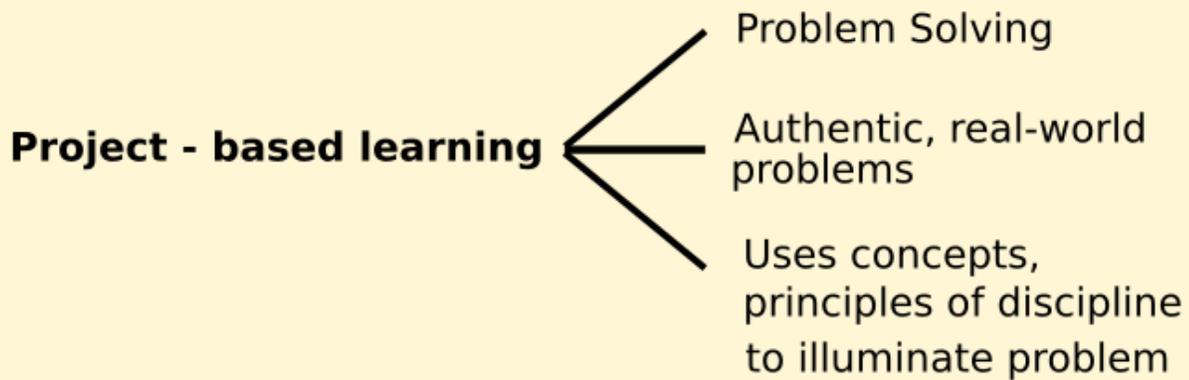


Figure 1.1 – Project-based learning

SELF-ASSESSMENT EXERCISE 1.3

Identify about five real-world problems that, in your view, need to be addressed. Then briefly describe each in no more than a single phrase or sentence. These problems may or may not be linked to the courses you are studying. This is a first step in developing your project. We will return to this list at various stages as we progress through the course.

1.3 What exactly is a problem, and what is problem-solving?

The Cambridge Dictionary defines a problem as “a situation, person or thing that needs attention and needs to be dealt with or solved”. The Collins English Dictionary is more to the point: it defines the term as “a situation that is unsatisfactory and causes difficulties for people”.

Using these definitions as a launching pad, we can think of a problem as some situation, state of affairs, occurrence or behaviour that is showing traits that are viewed as being undesirable and not in keeping with accepted norms. It is therefore having a harmful effect whether on itself or on its wider environment. With that interpretation in mind, I am proposing the following as problems since they are seen as having a negative impact in some real-world context:

- A decline in tourist arrivals in the country
- Disruptive classroom behaviour.
- Yearly flooding in Community X during the rainy season.

SOMETHING TO THINK ABOUT



Alongside this typical interpretation of 'problem', there is another that may be less obvious in an everyday sense, but which we should also take on board when thinking of projects in a formal sense. Specifically, a problem can also be seen in a situation that, in the eyes of those observing it, needs to be changed. From the point of view of the observers, what currently exists, the status quo, is no longer able to function at a satisfactory level. There is therefore a need for an enhancement or improvement.

Technology is one area where such a need for change is observed. Improvements in telephone communication, in motor vehicles, in household appliances are largely driven by a perception that there is a need for change. Such thinking is not restricted to the development of more advanced products. Newer processes, procedures and operations may also emerge in this way. For example, the advance in the information and communication technologies (ICTs) opened the way for educators and other professionals to move beyond the technologies of print and broadcast media for the delivery of distance education and take advantage of the interactive and distributed nature of the more advanced ICTs to offer programmes of study to a widely dispersed student population.

In a more specific way, this approach was evident in the launch of an online fundraising platform catering to some sectors of the Trinidad and Tobago population. The developer was of the view that the existing fundraising practices in the country were inadequate and therefore he introduced a tool that he saw as being more effective for the task. According to a newspaper report, he explained his decision this way:

FundMeTnT was created with the idea to provide a simple and easy-to-access platform that would not only making (sic) charitable and community giving easier for those who lead busy lives but want to contribute, but also serve to create a wider pool of donors beyond persons who would trek down to the bank to do cash deposits. (<https://newsday.co.tt/2018/11/08/digital-charity/>)

RESOURCE MATERIAL 1.2

Khan, K.A. *Digital charity: FundMeTnT, online platform to help worthy causes*. Trinidad and Tobago Newsday, Thursday 8 November, 2018. (<https://newsday.co.tt/2018/11/08/digital-charity/>)

SELF-ASSESSMENT EXERCISE 1.4

Read the entire newspaper article about FundmeT&T (see link above as well as on the course page). Identify the existing fundraising practices that the developer considered inadequate. Do you think that the developer has justified his case that the status quo needs to be changed? Write a paragraph explaining your position.

1.3.1 Other terms used alongside 'problem'

There are a few other terms that you will encounter depending on your area of study, which serve similar purposes as the term 'problem' in the project work context. See if you can detect some in this excerpt from Bell (2010) that looks at classroom practice in primary education. She states,

Learners pursue knowledge by asking questions that have piqued their natural curiosity ... the genesis of a project is an inquiry ... Many inquiries are science-based or originate from current social problems ... Children solve real-world problems by designing their own inquiries. (p.39).

There are two terms of note here. The first is 'question'. Recall that we saw it earlier when Helle et al. used it interchangeably with 'problem'. The second is 'inquiry', which is the name given to the activity that children undertake when they solve problems.

'Issue' is another term that is used in a way that bears a close relationship to 'problem'. Indeed, its connection with 'action research' also seems to be similar to the 'problem-project' relationship as reflected in the following explanation:

Teacher action research is based in schools. ... The process generally involves the teacher's identification of a classroom **issue** and the development of a research question. Ideally, the issue or problem is one "owned" by the teacher, and change is within the teacher's authority, should the research indicate that change is warranted. **(Emphasis mine)**. (Levin, 2006, p. 19).

In this course therefore, we regard the terms 'question', 'inquiry' and 'issue' as used above, as having a close relationship with 'problem' as we have interpreted it in the context of project work.

1.3.2 Problem solving – a two-part exercise

Now that we have clarified our understanding of the term 'problem', what about problem-solving? What do we mean when we talk about solving a problem? We should be cautious about transferring our everyday views about solving problems to the project-based learning context. Our typical interpretation of the phrase 'to solve problems' emphasizes the need to arrive at a solution, to get an answer. Having arrived (hopefully) at the correct answer, the problem no longer exists. This tendency towards getting an outcome that would eliminate the problem situation, shows itself up in at least two ways.

First, it is a requirement of some courses of study, for example mathematics and some of the sciences. The path towards arriving at the outcome, even though important, is secondary.

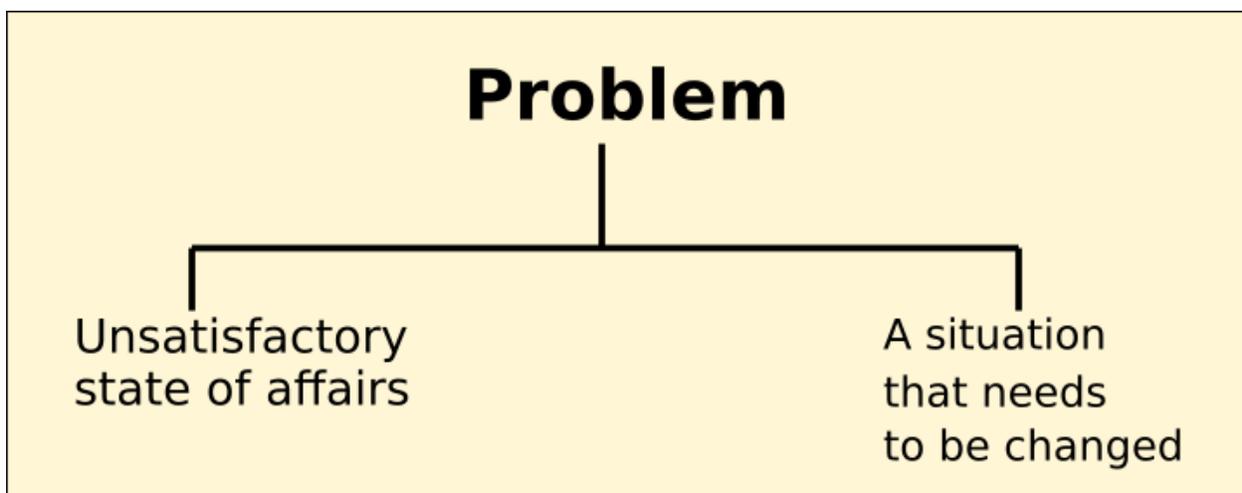


Figure 1.2 - Problem

One blogger views it this way:

It comes as no surprise that we naturally fall into solution mode. We have been hardwired to problem-solve since day dot. Think of the binary characteristics of all the exams and tests you have ever taken. You are given a problem that you are *required* to answer. Whilst it may be comforting to ponder about the problem, when the clock puts the sweat on you, it is time to quickly and efficiently solve the problem. (Moen Lee, April 2016)

In other instances, we feel that we must give advice about how to correct an unsatisfactory situation. Many times, what happens is that our own previously held concerns about the problem and our anxiety to fix it and make things better for all concerned, get the better of us. Before we know it, we are expressing some strong opinions about the situation, which probably we have not really thought through clearly. Then, on the basis of those opinions, we proceed to make recommendations and even persuade others to act in ways that we consider to be appropriate.

If you find yourself using phrases such as what people must, have to, need to or ought to/should do, or alternatively, what must be done, should be done, then you are on the wrong track. You are looking for a quick fix. Any tendency towards getting a premature solution should be avoided at all cost.

In the context of project-based learning, we want to curb the tendency to rush towards an outcome without fully understanding what the problem actually is. For that reason, in this course, we are emphasizing the need to view problem-solving as a two-part exercise. We are making a distinction between investigating the problem, that is, getting a clear understanding about what it is, and developing a solution for the problem, that is, formulating a response to alleviate the problem situation.

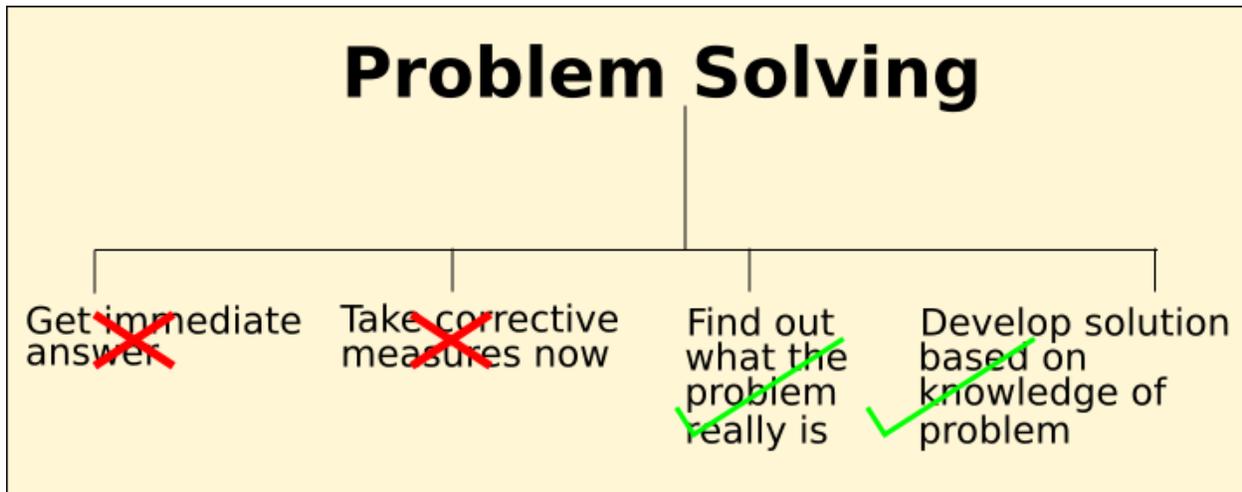


Figure 1.3 – Problem Solving

While not excluding the second, we will be focusing on the first part of the exercise in the rest of this Unit and this will continue into Units 2, 3 and 4. In Unit 5 we will turn attention to the second part. This is a conscious decision on our part, given the general tendency to overlook the investigating aspect of the problem-solving exercise.

SELF-ASSESSMENT EXERCISE 1.5

Do a second review of the list of problems that you created. Given the emphasis on investigating that I just mentioned, look carefully at your list and ensure that what you have described are problems as they exist and not solutions that you think ought to be implemented.

1.4 Developing the problem statement and project objective

Earlier, I identified three possible problems that I thought could be addressed through a project. These were:

- the decline in tourist arrivals,
- disruptive classroom behaviour and
- yearly flooding in Community X during the rainy season.

Looking at them a second time, it is clear that they are basically preliminary thoughts or ideas of what I consider to be unsatisfactory. To move forward, I have to do some refining. What exactly do I want to do about these problems?

1.4.1 The question

Project activity requires that we develop a problem statement. However, before we can begin that task, we need to clarify what exactly we want to do with the problem. Do we want to get more information about it or do we want to find a solution for it? Recall that the project can take either of these two problem-solving routes. However, as stated earlier, we are concentrating on getting a fuller understanding of the problem. We must therefore specify what we intend to do in clearer terms and we do so by formulating a question to guide us as we pull our thoughts together to come up with a broader statement about the issue of concern.

Let's generate questions for each of the problem ideas previously identified.

Decline in tourist arrivals:

- Why has there been a decline in tourist arrivals in Country X?
- What are the factors contributing to the decline in tourist arrivals in Country X?

If you look closely, you will realise that even though the two questions use different forms of language, they are seeking the same information.

Disruptive classroom behaviour

- How widespread is disruptive classroom behaviour in School Y?
- What reasons do students give for being disruptive in class?
- What effect does the disruptive behaviour in Class B have on students who do not consider themselves disruptive?

These are three completely different questions and naturally, they will take us along different paths for examining the initial problem idea. They are also targeting different groups within the classroom setting. In addition, each may require the use of a different method of collecting data when the project reaches that stage.

Yearly flooding in the community

- How are the lives of residents of Community X impacted by persistent yearly flooding?
- What steps do residents of Community X take to minimise the effects of the yearly flooding on their lives?

One common feature of all the questions above is that they are all seeking information on a single issue. None of them are combination questions. For example, we did not ask about the frequency of disruptive behaviour in classes and reasons students give for being disruptive as a single question. Combining two or more issues into a single question should be avoided at all cost, even if the issues pertain to the same problem idea. That will just make the exercise complicated and undermine your attempts to arrive at the best possible outcome.

Another point to be noted is that the questions listed above are at different levels of difficulty. For example, the question about the prevalence of disruptive behaviour in the school is seeking more basic information than the one inquiring about the effect of the behaviour on other students. That notwithstanding, one should be aware that, however simple a question may appear on the surface, working on it in a project requires you to examine it from all possible angles. We will return to that later.

Now it's your turn to convert your problem ideas into questions. As you embark on this exercise, you must note one important difference between the approach I took and the one you will be taking. I generated several different types of questions from each of my ideas in order to show you the range of questions that are possible from a single idea. In your case, you don't have to do that. You are going to formulate questions based on your interest and/or concerns. That interest and/or those concerns would have arisen because of your experiences and/or observations of a particular real-world situation. It is important to emphasize at the outset that you are the one undertaking the project and as such it must be a reflection of what you are interested in.

It is likely that you may have an interest in more than one aspect of a problem. However, since, as noted earlier, you cannot combine two ideas into a single question, the project will then be based on two separate questions. In this course, it is strongly advised that you restrict your efforts to a single question as two or more questions require more advanced research strategies and we would want to avoid that at this introductory stage.

SELF-ASSESSMENT EXERCISE 1.6

For each of the problem ideas you listed in SAE 1.3, and reviewed and probably made changes to in SAE 1.5, create a question that reflects your interest in and/or concern about this problem idea.

1.4.2 From question to problem statement

The problem statement is a fairly detailed account that provides a fuller description of the problem. It should be broad, and incorporate information from as many angles as possible. It is the question that you will be using to guide the process of formulating the problem statement, which should be no more than about one to two pages long.

To strengthen your position that this issue deserves attention, you would include the perspectives of others, for example ordinary individuals writing letters to the editor, persons holding official positions who are appropriately placed to give an informed view. You may also be able to locate reports of research studies that underscore the need for the investigation. There may also be official reports (from government and other public agencies) outlining initiatives taken in the past to address the problem and the outcomes of those initiatives. You should note though that you may not be able to find information that directly addresses the issue of interest to you. Nonetheless, you may be able to locate related information on the broad problem area (for example, general information on flooding) and you can draw on this to throw light on your specific concern.

One important feature of all the sources referred to above is that they provide first-hand information about the issue you are dealing with; they have a direct connection to the real-world situation.

1.4.3 The project objective

Having developed the problem statement, in which you laid out the case for conducting the inquiry, you will now set out the objective that you want to achieve from undertaking the project. Ending the problem statement with a clearly written objective, ensures that you remain focused on the intended outcome. Actually, there are no surprises about this aspect of the exercise. The objective will emerge logically from the problem statement, which in turn, was guided by the question you set yourself, based on the initial problem idea. In essence therefore, the objective is a re-fashioned version of the starting question. Following are objectives that were developed in relation to each of the questions listed earlier.

Decline in tourist arrivals:

Questions:

- Why has there been a decline in tourist arrivals in Country X?
- What are the factors contributing to the decline in tourist arrivals in Country X?

Objective:

- The objective of this project is to investigate the decline in tourist arrivals in Country X.

Disruptive classroom behaviour

Questions:

- How widespread is disruptive classroom behaviour in School Y?
- What reasons do students give for being disruptive in class?
- What effect does the disruptive behaviour in Class B have on students who do not consider themselves disruptive?

Objectives:

- The objective of this project is to determine the extent of disruptive classroom behaviour in School Y
- The objective of this project is to investigate the reasons students give for being disruptive in class.
- The aim of this project is to ascertain the effect that disruptive behaviour in a class has on students who do not consider themselves to be disruptive.

Yearly flooding in the community

Questions:

- How are the lives of residents of Community X impacted by persistent yearly flooding?
- What steps do residents of Community X take to minimise the effects of the yearly flooding on their lives?

Objectives:

- The objective of this project is to assess the impact of persistent yearly flooding on the lives of the residents of community Y.
- The aim of this project is to examine the steps that residents of community Y take to minimise the effects of the yearly flooding on their lives.

At this juncture you will temporarily put aside the exercise you have been working on up to this point and review a problem statement and project objective taken from a research study. This study was submitted by its author as partial fulfilment for the award of M.Sc. at the Kwame Nkrumah University of Science and Technology in Ghana.

It is not a project, but as you will soon realise, both a project and a research study comprise similar core components, even though the research study is a more advanced form of academic inquiry.

Read Chapter 1 of the research study (Resource material 1.3), then pay special attention to the problem statement and objectives. After reviewing those two segments, attempt the following SAE:

SELF-ASSESSMENT EXERCISE 1.7

- *The information that the researcher uses to formulate the problem statement can be separated into two sections. Think of a phrase that can serve as a suitable heading for the information in each section.*
- *Make a list of the types of sources from which the researcher gathered information to write the problem statement.*
- *What do you think about the connection that the researcher makes between the research questions and the problem statement, and between the research questions and the objectives?*
- *Do you think the problem statement can be improved in any way? If so, how?*

RESOURCE MATERIAL 1.3

Adams, A.G. (June 2008). Perennial flooding in the Accra Metropolis: the human factor.

Thesis submitted to the School of Graduate Studies, Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, in partial fulfilment for the award of Master of Science.

Looking back at the relevant section of the research paper, I would label the two main categories as 'efforts to control the flooding' and 'factors responsible for the flooding'. While the researcher makes a good effort to get credible evidence to support his claims about the flooding, some of his information is incomplete. As a result, the problem statement may not be as strong as it could have been. Nonetheless, it contains the elements expected of a problem statement.

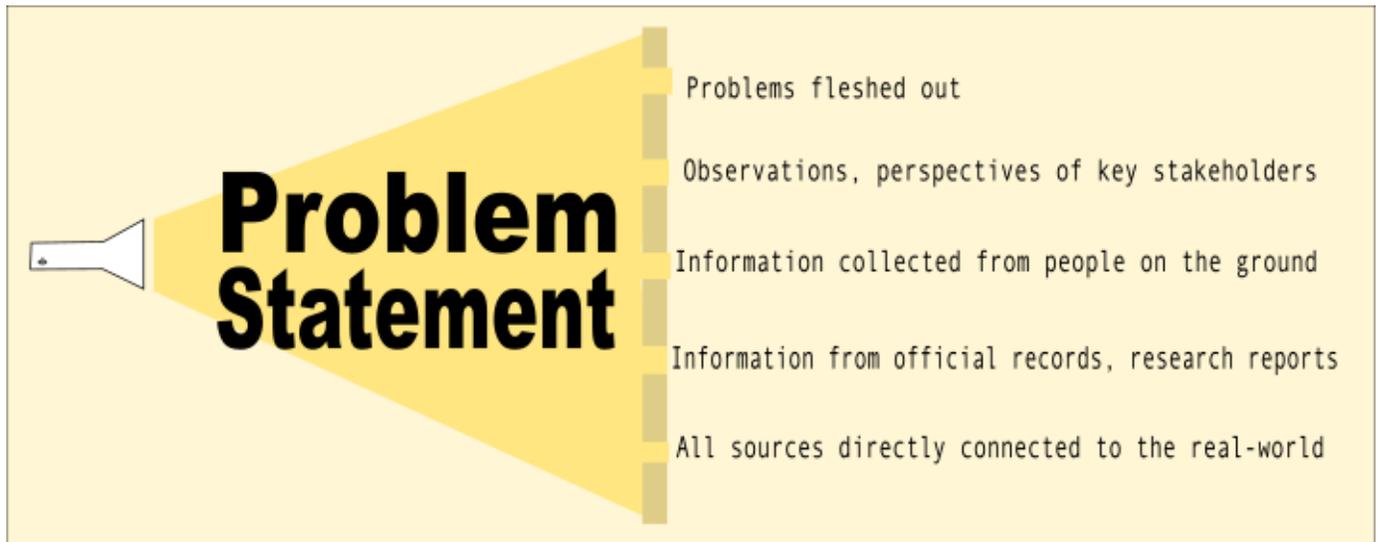


Figure 1.4 -Problem Statement

As noted earlier, this is a report on a research study, which is a more advanced form of academic inquiry than the project. For example,

- It is based on multiple objectives rather than a single one.
- While the research questions of the research study provide the basis for generating the objectives, the latter do not necessarily mirror the former in a direct way.
- The literature review is more extensive and more in-depth than the information gathering exercise of the project.
- Data collection and analysis methods for the research study are more complex.

SELF-ASSESSMENT EXERCISE 1.8

You are now ready to continue from where you left off in SAE 1.6. Select any one of the questions you developed from your original problem ideas and prepare an appropriate problem statement of no more than two pages. You will follow up the statement with the project objective. Even though you are focusing on only one problem/question for this exercise, do not discard the others as you may want to develop another at a later point.

Key Takeaways

- Examples of project excluded from this course: everyday projects; project-management type; design and build projects; assignments based on open-ended topics.
- Key features of projects based on problem-solving:
 - Learner-driven
 - Problem – authentic
 - Real-world experiences viewed through lens of theoretical knowledge.
- Explanation of 'problem' – unsatisfactory state of affairs; status quo needs to be changed
- Problem solving – investigating problem; developing a solution.
- Question developed to refine problem idea.
- Problem statement created to flesh out question, using information from sources with direct connection to problem.
- Problem statement presents view of problem from different angles.
- Project objective generated from question and problem statement.