

DEVELOPING SOLUTIONS; CREATING INNOVATIONS

Getting started

Let's just do a recap before proceeding. First, our primary purpose in this course is to develop the skills for doing project work, which we have also referred to as project activity, and using a more contemporary term, project-based learning. Acknowledging that projects may be of several types, we have narrowed our focus to the project as a vehicle for problem-solving. Following from that, we have also identified two dimensions to the task of problem-solving, namely finding out what the problem is and developing a solution for the problem of which we now have a clearer understanding.

In this course, we decided to place greater emphasis on finding out what the problem or issue is. To this end, Units 2 – 4 focussed exclusively on strategies aimed at investigating or inquiring about a problem.

In this final Unit, we turn attention to the solution for the problem. To initiate this aspect of the problem-solving exercise, we will look at some solutions drawn primarily from popular, informal information sources. The intention is to examine what is being proposed, to determine the adequacy of the proposal as a solution, to examine whether there is any attempt to articulate the problem that led to the solution, and, if yes, to assess the strength of the link between problem and solution.

As a follow up, we will also examine proposals that are advanced as innovations to determine the extent to which they fit into the mould of solutions to problems.

Learning Objectives

- ❖ *Identify and describe projects that focus on the solution to be developed.*
- ❖ *When the purpose of the project activity is to develop a solution, first locate the underlying problem before proceeding.*
- ❖ *Draw out and use whatever limited information is provided about the problem, to build a fuller understanding of it.*
- ❖ *Distinguish between solutions aimed at minimising the effect of an unsatisfactory situation and those intended to effect change.*
- ❖ *Recall the popular interpretation of the concept of innovation.*
- ❖ *Discuss the limits of such an interpretation and justify the need to make the link between an innovation and the problem that gave rise to it.*
- ❖ *Identify criteria used to determine whether a product or a process qualifies as an innovation.*
- ❖ *Explain how developing a project proposal is essentially a way of developing a solution in response to a problem.*
- ❖ *Identify and explain the steps in writing a project report/project proposal.*

5.1 So what about the problem?

The question that arises now is, when the project activity requires you to design and develop a solution, does this mean that you are required to do a thorough investigation of the problem before proceeding to the solution? The simple answer to that question is, it depends. Very likely, there is already adequate information about the problem that already exists, making it unnecessary for you to undertake an investigation. However, since the problem and your proposed solution are not directly linked, you would need to justify your decision to make a connection between your idea for the solution and the problem situation you have identified. It is important for you to identify the similarities between them, in order to demonstrate that the problem that you identified in a different setting is equally applicable to the context within which you are planning the solution.

It is also likely that what you have been able to identify as a probable problem situation is only partially satisfactory. You must therefore either continue the search to locate additional scenarios to fill in the gaps, or alternatively undertake some limited investigation in order to get a more thorough picture of a plausible problem situation.

All of the above will provide you with information to build a rationale that is capable of laying the foundation for the solution you intend to develop.

5.2 Linking solutions to problems

You will recall that in Unit 1 we identified two ways of looking at a problem. In one instance, we viewed it as an unsatisfactory, or at least an undesirable situation that is capable of causing harm. Alternatively, we saw it as a situation which, in the eyes of those observing it, needs to be changed.

In the first instance, the solution will be an occurrence or development that can serve to remove the unsatisfactory situation or minimise its effect in a way that yields positive outcomes. On the other hand, when we view the problem as a situation that needs to be changed, the solution is aimed at altering what currently exists in order to provide an improved or enhanced form of existence and/or way of doing things.

Following are three examples of solutions. The first can be regarded as a response to an unsatisfactory situation and the other two as attempts to bring about change.

5.2.1 First example

Resource Material 5.1

Problem Solving, Part 2 : Video-taped interview on breastfeeding problems, with author of *A Practical Handbook for Breastfeeding Moms*.

In Part 1, we looked at the problems that nursing mothers experience when breastfeeding. In this second segment we will examine the solution that was developed to address those problems, namely the *Handbook for Breastfeeding Moms*.

Study the video presentation then attempt the two self-assessment exercises that follow.

Self-assessment exercise 5.1

- Briefly outline the rationale that the interviewee (author) provides for using a book as the vehicle for addressing the problem.
- Identify the main content areas of the handbook as revealed in the interview and the justification given for their inclusion.
- State the expertise that the interviewee brought to the task of authoring the book.
- Identify any probes that you noticed in the interview.

Self-assessment exercise 5.2

To what extent do you think this solution is capable of addressing the problems previously identified in Part 1? If you think that the handbook is a suitable solution, outline your reasons for saying so. At the same time, if you think that it is not completely suitable, outline the ways in which it falls short. Your reasons should be based on information obtained from the interview.

Then, taking both the pros and the cons into consideration, give an overall assessment of the handbook.

5.2.2 Two other examples

As noted earlier, the next two solutions are aimed at changing the status quo. Both highlight the efforts of people in a community to bring about change in order to move their situation to a preferred state, thereby improving the quality of their lives.

Resource Material 5.2

Eatahfood. *Out and About: Fifth annual pigeon peas festival*. Covigne Road, Diego Martin, Trinidad and Tobago. EAF Channel video presentation, February, 2019.

Resource Material 5.3

Zoomin Local Heroes. *Upcycling Lords: From Banana to Paper*. Namulanda, Uganda. Zoomin Local Heroes video presentation, November, 2018.

Self-assessment exercise 5.3

- Now that you have viewed both presentations, what will you say are factors requiring change in each of them? In other words what is/are the problem(s) to be addressed in each?
- Assess the strength of the link between the solutions and the stated problems. Do you think that the solutions flowed logically from the problems?
- Imagine that you are required to develop your own project in one of these situations. As part of that project, you think it will be useful to interview one of the participants in one or other of the presentations. In that regard, you are required to do the following
 - State the purpose of the interview
 - Identify the individual with whom you will conduct the interview
 - State the reason for selecting that particular individual
 - Prepare the interview schedule to guide the conduct of the interview.

5.2.3 The project proposal: a plan for developing a solution

Alongside the three examples given above, the project (or programme) proposal also qualifies as a solution for which the problem must be articulated. In some instances, the project you are undertaking, is based on a problem that has been defined to a limited extent, and you are required to develop the solution. A project proposal entails the submission of a fairly detailed plan for implementing a solution for a problem that has been identified, but only minimally. The following is a typical assignment that you may be required to undertake as part of your studies:

The Ministry responsible for youth development in your country is inviting proposals from suitably qualified persons to design a programme targeting vulnerable youths in the age group 16 – 24 years who are either unemployed or underemployed and many of whom are school dropouts. The programme is intended to form part of the government's ongoing Poverty Eradication Initiative.

Your proposal must lay out plans for a programme to be offered over a six-month period to meet the following broad goals:

- *To equip participants with appropriate employable skills*
- *To enhance their capacity to lead productive lives as citizens of their country*

Some relevant points to be noted

- In the first instance, this project assumes that you are fully aware of what constitutes Poverty Eradication in its general global sense, as outlined by the United Nations and other global organisations, as well as how it has been interpreted by your government to meet the particular circumstances of your country.
- Even though the project does not specifically say so, you will be required to present a proposal.
- While the invitation from the ministry provides a broad idea of the population for whom the programme is intended, you will need to gather more specific information in order to identify a clearer target group.
- A more thorough investigation of the problem to be addressed needs to be undertaken in order to better inform plans for developing the solution.
- Your decision to undertake this project is an indication that you know that you have the relevant expertise to undertake the assignment.
- You realise that even though you have much expertise in this broad area of youth training and development, there are some aspects that you may not be very familiar with. You must therefore build a team. You must therefore (a) identify the areas for which you need to source professional assistance and (2) conduct a search for suitably qualified persons.

5.3 Innovations: solution to a problem, a novel idea, or both?

Based on the preceding discussion about linking solutions to problems, one is likely to assume that innovations will follow a similar path. While, theoretically this may be so, in reality, when people speak about an innovation, there is often very little mention of a problem from which it has emerged.

The term, innovation, has been defined as a new idea, method or device (Merriam Webster)¹ as well as the use of new ideas and methods (Cambridge)². The Organisation for Economic Cooperation and Development (OECD), in its 2005 Glossary of Statistical Terms, provides a more detailed explanation as follows:

An innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation, or external relations. (OECD, 2005)³

What is interesting is that the idea of responding to a problem situation does not arise in any of the definitions. Nonetheless, it is difficult to conceive of something new or significantly improved emerging without reference to some prior situation, experience, event, object or other type of phenomenon that needs to be changed or improved.

It would seem therefore that it may be appropriate to think of the novel idea, product or process as a change or at least an improvement on an existing reality. In short, if the project being undertaken is intended to yield something significantly different from what obtains, it may be useful to consider it from the perspective of generating a solution to a problem and therefore requiring a clear understanding of the problem situation itself.

This perspective on innovations seems to be shared by the authors of the Quartz Africa Innovators as reflected in their introduction to the 2018 list of innovators. They contend,

We've never believed innovation is simply about technology and gadgets. It's about innovative thinking in all areas ... The kind of innovation that drives making strides to end a killer disease, change agriculture with technology or bend and blend artistic genres.

There is a metaphorical arms race featuring Africa's fast-growing population versus unemployment, rising non-communicable diseases and the impact of climate change, among other challenges. These issues need clear thinking, strong leaders and the kind of innovation you find when you

¹ <https://www.merriam-webster.com/dictionary/innovation>;

² <https://dictionary.cambridge.org/dictionary/english/innovation>

³ <https://stats.oecd.org/glossary/detail.asp?ID=6865>

go through this year's list. These men and women show that talk of **African solutions for African problems** isn't just a catchy meme. It's very real and very important. (emphasis mine). <https://qz.com/africa/1389574/quartz-africa-innovators-2018-a-list-of-30-pioneers/>

It is against that background that we will examine the following two developments, which have been described as innovations.

5.3.1 The G-PAN: steelpan innovation

In an interview with the web-based magazine, *When Steel Talks*, <http://www.panonthenet.com/index.html>, Prof. Brian Copeland of the University of the West Indies, St. Augustine campus, speaks about his innovation, the G-Pan, which he views as an improvement on the steelpan, the musical instrument that was created in Trinidad and Tobago in the early twentieth century. According to Prof. Copeland, the G-Pan is intended to “re-engineer the traditional steelpan ... through a marriage with technology”.

Read the interview carefully, then consider and respond to the questions that follow:

Resource Material 5.4

When Steel Talks (March, 2010). *An interview with steelpan innovator and G-Pan inventor, Brian Copeland*

Self-assessment exercise 5.4

- From your reading of the interview, do you detect any problem(s) that the creation of the G-Pan is intended to address?
- How does the G-Pan improve on the traditional steelpan instrument?
- What features of the G-Pan establish it as an innovation, notwithstanding the fact that it grew out of the traditional instrument?

With regard to the second question, there are several areas of improvement that are either directly mentioned or alluded to in the interview. I will focus on two here. First, there is the issue of size of a steel orchestra. With the traditional instrument, a steel orchestra must comprise eleven sets of instruments, with some sets comprising more than one instrument in the set. For example, there is the 9-bass set and the 6-bass set. In the traditional set-up this large number of pans is necessary to accommodate the range of notes required in the orchestra. The G-Pan family of pans comprises only 4 sets of pans with the G-6 Bass, for example, carrying all the notes previously contained in the 9-bass, 6-bass and tenor bass ranges.

A second area in which the innovation improves on the traditional is the chime or rim of the playing surface. As stated by Prof. Copeland, the G-Pan utilises 'rolled flats' for the chime and this improvement in the design of the chime serves to eliminate the buzzing noise that arises in this part of the traditional instrument.

With regard to the question as to whether it is or is not an innovation, two statements from the innovator seem to address this issue. In the first instance, Prof. Copeland asserts that the creation of the G-Pan entailed the purposeful redesign of its component parts, namely the playing surface, the chime and the skirt. Secondly, he speaks of a "compound design approach whereby the individual component parts of the instrument ... are optimized for their specific function ...".

Do you think that there is a need for more details in the interview to convince the reader that the G-Pan should be considered an innovation?

5.2.2 Sargassum and innovation in agriculture

The problem driving the second innovation is the excessive amount of sargassum (seaweed) that is washed up along the coastline of the islands of the Caribbean at specific times during the year. Several layers of the seaweed, as much as ten feet in depth, cover the beaches and, as it rots, give off a pungent odour that smells like rotten eggs. Sargassum has become a major environmental hazard for many Caribbean countries affecting the day-to-day lives of the coastal population and including important economic activity such as fishing and tourism.

The video-taped interview (2015) and the feature article (2018) both report on the entrepreneurial initiatives of the young St. Lucian, Mr. Johanan Dujon, who seized the opportunity for the development of agriculture that the sargassum problem presented.

Resource Material 5.5

IslandAgriCULTURE, St. Lucia. *Agriculture on the move: Sargassum (seaweed)*. Interview conducted with Mr. Johanan Dujon, Managing Director of ALGAS Organics, St. Lucia. Youtube video, October, 2015.

Global Environment Facility (May, 2018). *Communities innovate to address sargassum seaweed on coasts of St. Lucia*.

Self-assessment exercise 5.5

- As far as you are able to detect from the interview, what were the different tests conducted in the development of the product?
- Name the external agencies that ALGAS Organics approached for assistance. What type of assistance was requested of (and obtained from) each?
- Based on information obtained from both sources (video and article) what, in your view, are the main operational areas of this facility?
- The use of seaweed to produce fertilizer is fairly widespread. Should the product of ALGAS Organics be considered an innovation? If yes, why? If no, why not?

An innovation is bringing something new into the environment, something that is sufficiently different even as it probably incorporates elements of what already exists. It is on that basis, the G-Pan is recognised as an innovation. Further, it is also useful to highlight that the decision to develop the product should emerge out of a clear understanding of an existing problem situation that requires significant re-fashioning and/or the injection of something bold and decidedly different. In addition, as observed in both innovations examined here, the development of the innovation must be underpinned by a clear research and evaluation agenda to assess if and how the innovation is meeting intended goals.

5.4 Writing the project report/project proposal

In Unit 4, we provided an outline for writing the report for a project aimed at investigating a problem. A project report is also required for this other aspect of the problem-solving exercise. It applies whether the focus is on the solution with only limited reference to a problem, whether the point of departure is more biased towards the creation of an innovation, or whether there is an assignment to develop a proposal to address a named problem. Following is a format for writing the report for a project that entails developing a solution.

5.4.1 Format of the report

1. Executive Summary
2. Title
3. Introduction
4. Project Rationale
5. Project Objective
6. Background Literature
7. Project Plan
8. Research and Evaluation strategies
9. Project Duration
10. Project Team
11. Budget
12. Conclusion

The **Executive Summary**, which is the last section to be written, provides an overview of the entire report to allow the reader to get a full picture of its contents before going into its details.

Through the **Title**, the reader must be able to get a complete idea of what the project is about and what it is intended to achieve.

The **Introduction** places the project idea in an appropriate broader context, briefly accounts for your interest in it, and, expanding on the title, outlines what the project is intended to achieve.

There are two main parts to the **Project Rationale**. On the one hand, it provides a justification for undertaking the project; in other words, it states the importance of developing the product or the process, outlining its potential impact and the benefits to be derived from its use. Simultaneously, this section of the report will also draw attention to the existing situation out of which emerged this idea as a solution to what may be viewed as an unsatisfactory or even undesirable state of affairs, or alternatively, a situation that needs to be changed. This section of the rationale is similar to the problem statement discussed in Unit 2. Every effort must be made to ensure that there is a clearly articulated problem situation to justify the decision to develop the solution.

The Project Rationale leads into the **Project Objective**, which is a clear, succinct statement outlining the purpose for undertaking the project and the expected outcome.

With the project objective in mind, you will conduct a search of sources to identify information that can provide greater insight into the solution you are interested in. This search and subsequent write-up of the **Background Literature** will bring to the fore pertinent ideas, research findings, descriptions and/or evaluations of related projects that you can examine, critique and, as appropriate integrate into your ideas for your own project.

You now have a wealth of information in hand to lay out the plans for the work to be done. The **Project Plan** is the framework that you will build to organise all the inputs required that would yield the intended output(s) consistent with the project objective articulated earlier. Such inputs will include but are not restricted to:

- Knowledge and skills required for developing the solution
- Knowledge and skills required for managing the project-implementation process
- A listing of equipment and other material resources for project implementation
- Human resource requirements.

Very importantly, the plan would also include a detailed schedule of work to guide the implementation all the required activities in an organised and systematic way.

Research and Evaluation is a key component of the project exercise. As you design the project, it is important that you outline the measures to be taken during the implementation phase to assess whether the activities being undertaken at various stages, are consistent with the overall project objective.

In light of the foregoing, you are now in a position to state the **Project Duration**.

You are now also able to determine the composition of the **Project Team**.

The **Budget** will reflect your best estimate of expenses likely to be incurred when executing the project plan. If the amount exceeds what you consider reasonable, you will need to go back and make appropriate adjustments.

In many instances, a project of this type that is undertaken as part of a programme of study in a formal education setting, does not require students to move to the implementation phase and actually develop the solution. However, in the event that this is required, it must be preceded by a full project report as described above.

Key Takeaways

- Even when the focus of the project is to develop a solution, that solution should be linked to a plausible problem situation.
- When the problem is only minimally identified, or not all, then efforts should be made to flesh it out in order to lay a solid foundation for the proposed solution.
- The fleshed-out problem may be constructed by drawing on experiences from a similar real-world scenario and/or by conducting a limited investigation.
- A project (or programme) proposal is essentially a proposal for a solution to a problem that has been identified, however minimally.
- While the dominant view of an innovation is as a novel idea, there are those who contend that it is its role as a solution to a problem that should be emphasized.
- While acknowledging that there is an ongoing debate about what constitutes an innovation, it can be argued that a basic criterion is that it represents a major development on and is significantly different from what exists.
- Research and evaluation should be an integral part in the development of an innovation.
- One must follow a systematic approach to formulating the report for this type of project activity.