

**A Framework for Sustainability of
Advanced ICT Education in a
Developing Country**

**Highlights of a PhD Research Plan
Presented to the University of Pretoria,
South Africa**

**By
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- ***Sustainability***

Capacity of a social entity to continuously execute its mandate and mission for now and the future by harnessing and managing its institutional, technical, financial and contextual resources, opportunities and challenges to attract and maintain current and future stakeholders, clients and constituencies. (working definition)

Framework

- An adaptable improvised process, milieu, means or medium for undertaking action, making improvements or conducting research in a changing, evolving and emergent social context. (Working definition)

Advanced ICT Education

Postgraduate ICT/IS/MIS Education from Master's degree upwards
(inclusive)

Developing Country

Least/less developed Countries mostly in the Southern hemisphere,
with majority of citizens being poor/poorer and living below \$2/day
Purchasing Power Parity (P.P.P.) As

Todaro asserts, “despite the obvious diversity of countries and classification schemes, however, most Third World Nations share a set of common and well defined goals....and common problems shared in varying degrees by most developing countries; widespread and chronic absolute poverty; high and rising levels of unemployment and underemployment; wide and growing disparities in the distribution of income; low and stagnating levels of agricultural productivity; sizeable and growing imbalances between urban and rural levels of living and economic opportunities; antiquated and inappropriate educational and health systems; severe balance of payments and international debt problems; and substantial and increasing dependence on foreign and often inappropriate technologies, institutions, and value systems” pp.14, 18 (Todaro, 1989)

- **Problem Area**
- Sustainability in business, organizations and education, in higher education in general and postgraduate ICT education in particular is a real challenge in developing Countries. Developing Countries cannot afford the luxury of valuable resources going down the drain. But there is general widespread lack of sustainable initiatives and programs in developing countries and the sheer waste of limited resources, in the face of immense suffering and deprivation of numerous populations of many developing countries is a matter of Concern, for “Normally, the poorer the country, the harder it is for it to sustain projects for lack of adequate financial resources and managerial and technical competence. For financing institutions, there is thus a dilemma between the wish to eradicate poverty in the low-income countries by initiating socially conscious projects and that of establishing sustainable projects in order to ensure the institution’s own viability.” P. 1(Mubila, M.M., Leyeka Lufumpa, C. and Kayizzi-Mugerwa, S. 2000)
- The widespread lack of sustainability in this way; the failure of many well intentioned initiatives and the inadequate organizational, Institutional, human, material, financial self-sufficiency in post-graduate education in developing countries, compound the challenges of sustainability for yet another new initiative like the Ghana Institute, especially as there is not much research on why projects fail and what has been done to safeguard the situation.

- **The Problem statement**
- Higher Education in Developing Countries faces Problems of Sustainability. Much has not been documented on the extent of the problem and how it has been researched and solved. In view of this, The Ghana Osei Tutu II Institute for Advanced ICT Studies faces the possibility of not being able to survive beyond the initial Dutch funding phase of five years. This is because there are prevalent difficulties in sustaining higher education in developing countries and more so, if it is at the postgraduate level. There is therefore concern as to how a postgraduate Institute in ICT studies will be sustained. It is offering an MSc. Program with Foreign visiting Lecturers and Donor Funding. There is the need to use these practical problems at The Ghana Institute to learn about and contribute to the body of knowledge on Sustainability in higher education, whilst solving the practical challenges at the Institute. The Ghana Institute currently has a low student intake, which may be partly because of time scheduling not favoring prospective students and the competition for students from other players and inadequate marketing

- **Research Questions**

- Key 1: How may we understand the Challenges and opportunities for sustaining Postgraduate ICT education in a developing Country?
- Sub 1:1 How may an Academic Institution Offering only Msc. Program in ICT with foreign visiting lecturers and donor funding be sustainable?
- Sub 1:2 what framework might we develop and apply to assess the Sustainability of Postgraduate ICT Education in a developing Country?
- Sub 1:3 what framework might be implemented to improve sustainability of postgraduate ICT education in a developing Country?
- Sub 1:4 What may be the Clear outcomes, effects, Tools, instruments and products of Sustainable Postgraduate ICT Education in a developing Country?

- **Research Objectives**
- **General Objective**
- Understand the Challenges and opportunities for sustaining Postgraduate ICT education in a developing Country.
- **Specific Objectives**
- Develop and apply a framework to assess sustainability of postgraduate ICT Education in a developing Country.
- Implement a framework to improve sustainability of postgraduate ICT education in a developing Country.

- **Hypothesis**

- If we apply a sustainability framework to the Ghana Institute through a critical interpretive action research process, it will improve the sustainability of the Institute in particular and increase our knowledge in general of challenges, opportunities and processes for sustainability of Organizations.

- **Expected Findings**

- Developing and applying a sustainability framework in an action research process will help to improve the sustainability of the Ghana Institute in particular, and contribute to the knowledge on challenges and opportunities for sustaining post graduate ICT education in a developing country context , and the body of knowledge on sustainability of organizations in general.

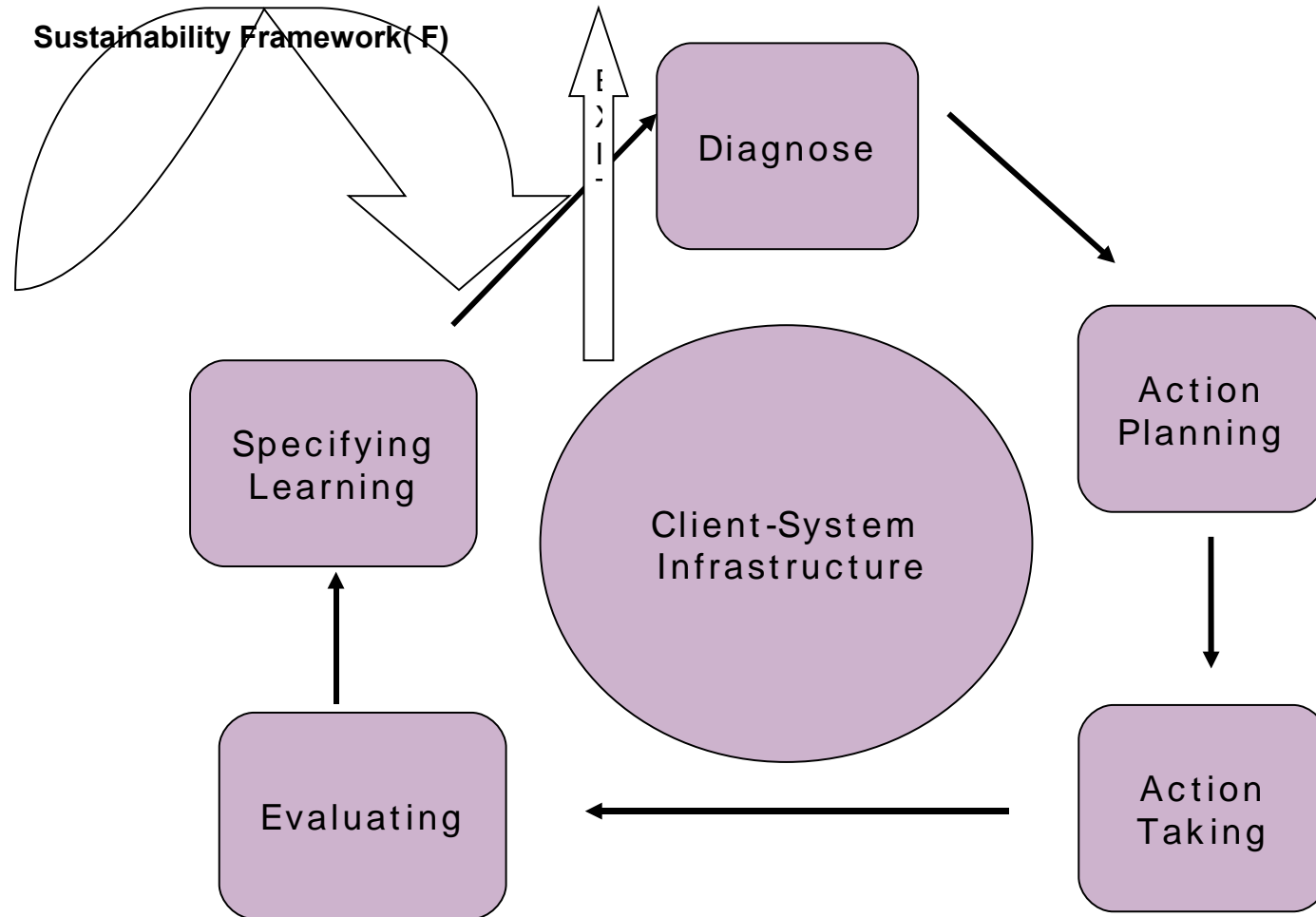
- **Critical Interpretive Paradigm**

- The Research will be informed by both interpretive and critical paradigms. Interpretivism and Criticality go together. They complement one another. When used together they have better impact than each standing alone. This is because interpretivism seeks meanings, understanding and perspectives of participants, criticality on the hand helps to change the situation by critiquing the status quo, making suggestions as to how things might be changed and where relevant putting in place concrete practical actions to implement intended changes (Pozzebon 2004). Several interpretive researchers are also critical ones (Walsham 2005, Howcroft and Trauth 2004, Pozzebon 2004)
- Again, both are relevant and useful to the Action Research process in which we both take action and reflect at the same time, seeking to understand and instituting changes at the same time. The interpretive will help more in seeking out information and the critical will help the action research process to contemplate the changes needed, and how to make them (Jonsson 1991).
- The exercise of reflection in Critical Interpretive will be used at several levels. First level is interpretation related to interviewing. The second level is hermeneutics-interpretation related to text i.e. data analysis guided by literature and theory. As the data reveals unequal and distorted situation, the third level of reflection will be critical, where the elements and factors responsible for the contradictions will be historically contextualized, proposing suggestions and actions for remedy and finally be reflexive on our own language use, methods, decisions, and processes as to whether better ways could have been used making changes as necessary.

- **Research Method**
- **Action Research**
- Lewin's original six-points iterative process(analysis, fact finding, conceptualization, planning, implementation of action, evaluation.) , was slightly modified by Susman(1983),Susman and Evered(1978) to a five-point canonical cyclical process(diagnosing, action planning, action taking, evaluating, specifying learning), as indicated in Fig. 2 below (Baskerville, R. and Wood-Harper, A.T.1998;Germonprez,M. and Mathiassen,L.2004)

FIG.2 Canonical Action Research Method

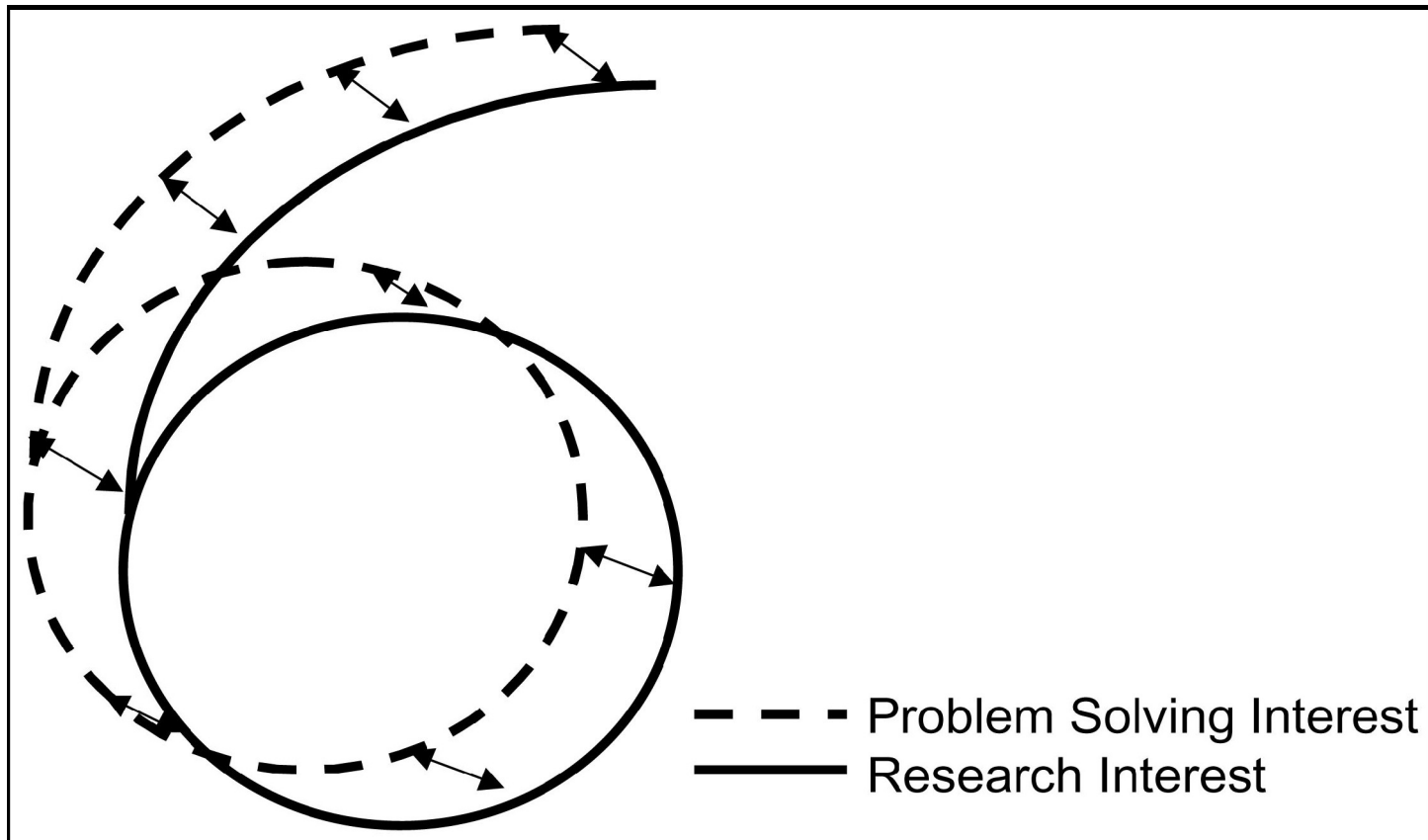
- Fig. 2 Canonical Action Research adapted and modified from Roode, D. 2007, INF-830, Department of Informatics, University of Pretoria, South Africa, who adapted from Baskerville, R L and A T Wood-Harper (1996). A critical perspective on action research as a method for information systems research, *Journal of Information Technology* (1996) 11, 235 – 246.
- Move bibliographical details to reference list at the end.



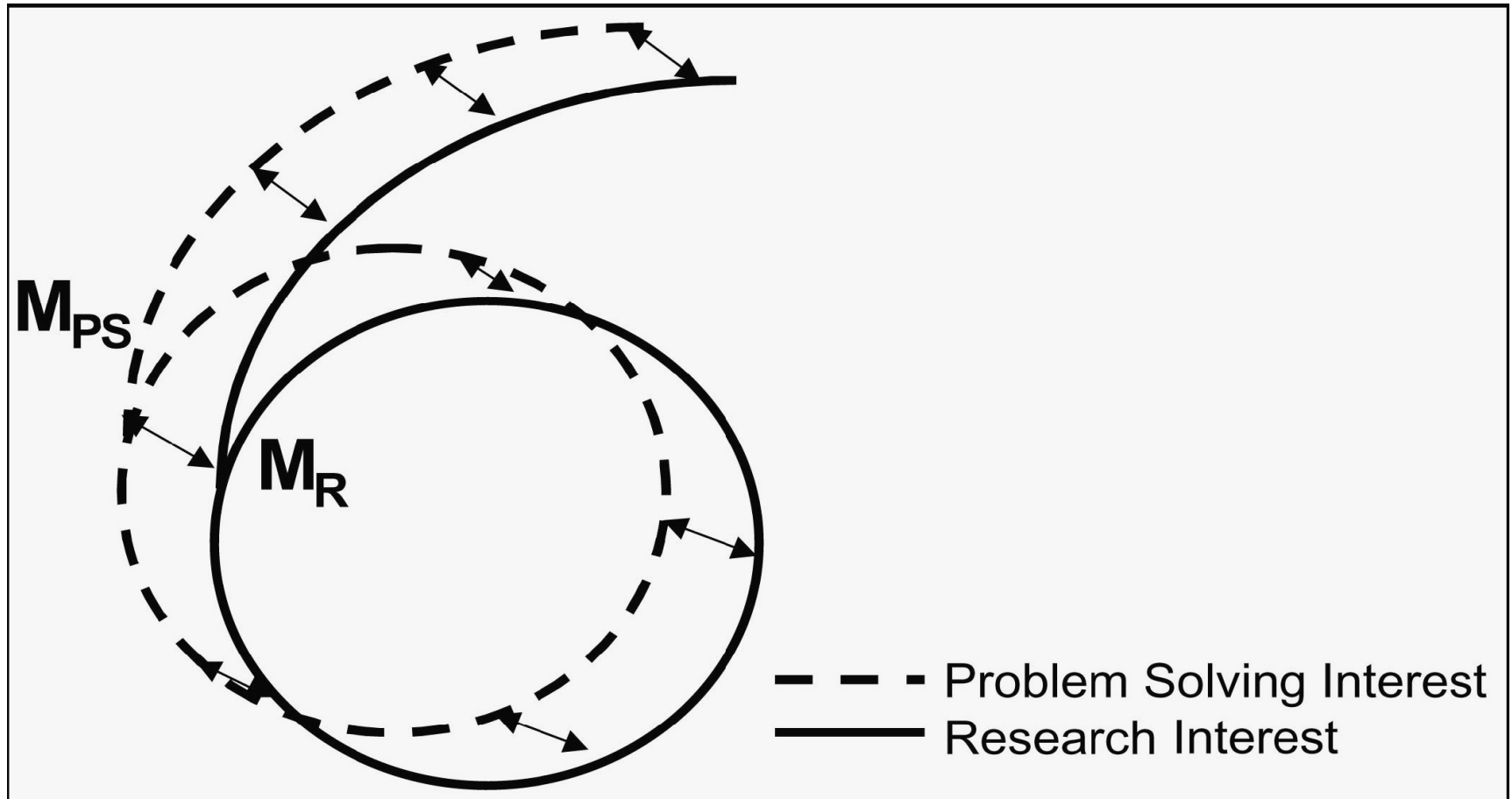
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This canonical 5-point process in Fig. 2 will be undertaken as in Fig. 3 as McKay and Marshall suggest that the cyclical process should be construed as two parallel interacting cycles, The research interest cycle and the problem solving cycle, one focusing on the problematic situation and the other on the scientific knowledge goals. This two-pronged cycles can be carried concurrently by the researcher in two hands as he goes along, and helps researcher bear in mind to separate and interact the two concerns meeting the dual goals as necessary. (Germonprez,M. and Mathiassen,L.2004;McKay,J. and Marshall,P.2001)But then when it becomes necessary to exit the research, it is possible to do so without the Organizational improvement aspects being affected., thereby going around the dilemmas of ethics, goals and initiative, and avoiding the tendency of either tilting towards the research goals or the practical improvement goals(Germonprez,M. and Mathiassen,L.2004), as indicated in Fig.3 Below.

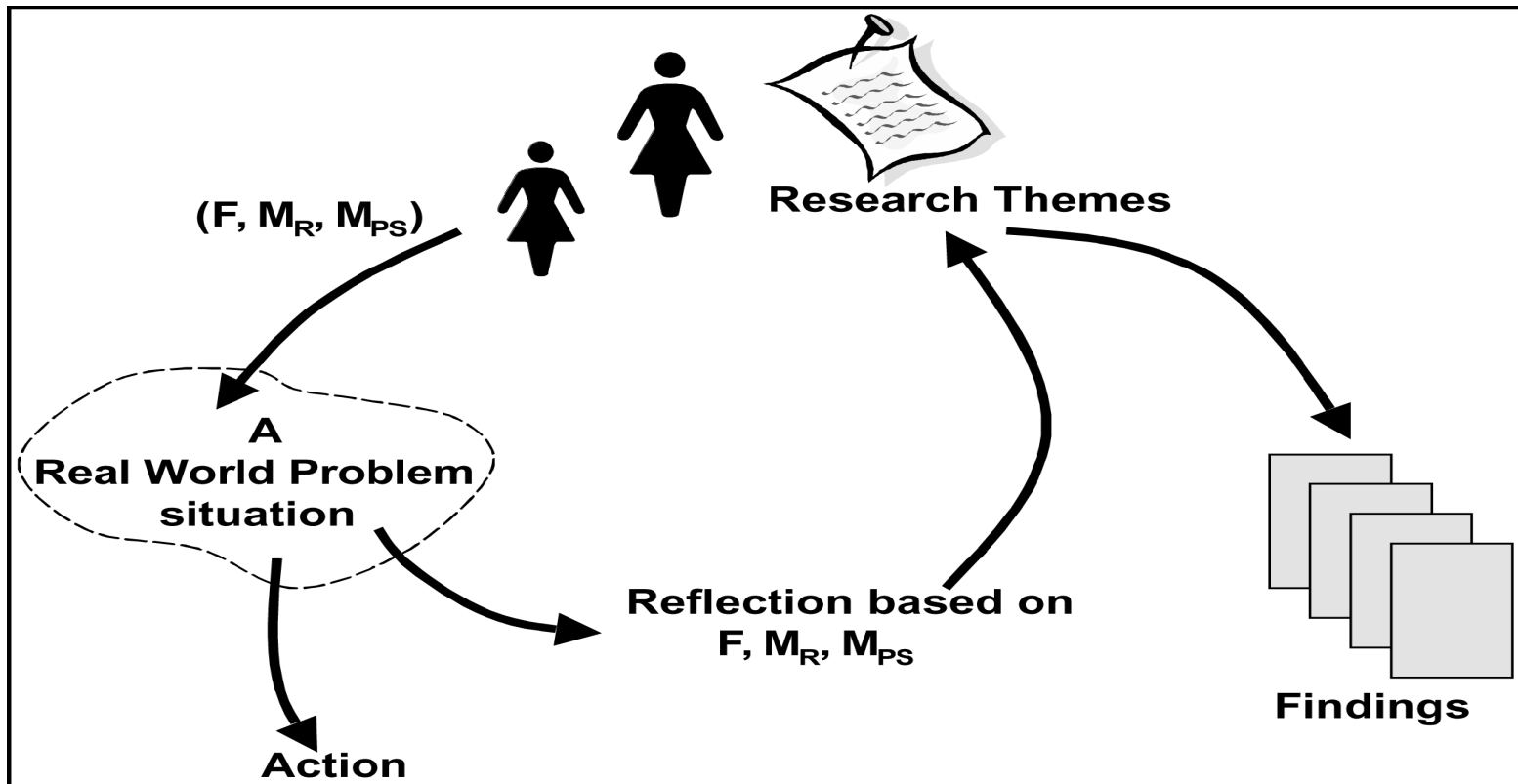
Fig. 3 Two concurrent Cycles, goals, processes and outcomes in Action Research(AR) adapted from Action research viewed as a dual cycle process P. 52 McKay and Marshall 2001, Dual Imperatives of Action Research, Information Technology & People, Vol. 14 No. 1, 2001, pp. 46-59.MCB University Press, 0959-3845



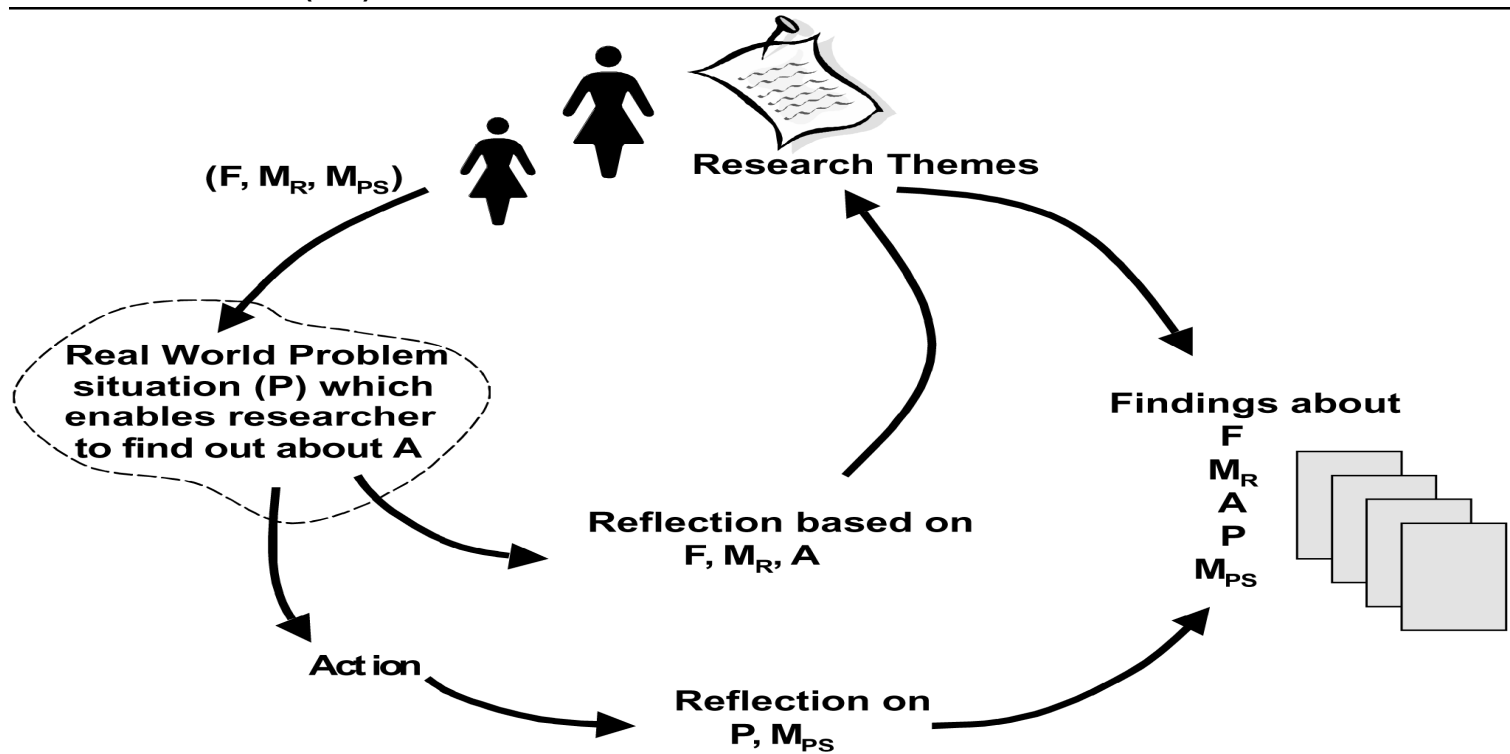
- Fig. 4 Two concurrent Methods Mps and MR copied from Thinking about MR and MPS P. 53 McKay and Marshall 2001, Dual Imperatives of Action Research, Information Technology & People, Vol. 14 No. 1, 2001, pp. 46-59. MCB University Press, 0959-3845
- As in Fig. 4 below, the two cycles can also be seen as two methods. The Problem solving Method (Mps) and the Research Method (MR). In this way there is no confusion about whether one is in a consultancy or research. As it is clear that there are different methods for organizational improvements and another for research.



- Fig. 5 Synthesized Action Research Process adapted from Revised Action Research Framework p. 54 McKay and Marshall 2001, Dual Imperatives of Action Research, Information Technology & People, Vol. 14 No. 1, 2001, pp. 46-59. MCB University Press, 0959-3845
- In Fig. 5 The Research Process as presented by Checkland originally and as modified by McKay and Marshall are being synthesized. So not only is F, M being applied to A in action leading to learning about F, M, A, as Checkland originally intended, but also, M has been split up into two methods so our reflection and learning is about the Two methods as well in addition to F, A. And I have introduced (I) Improvisation to take care of the flux, uncertainties and unexpected happenings which are a real part of our Social experience, which can either come in or go out as shown by the respective arrows in Fig. 5 and 6

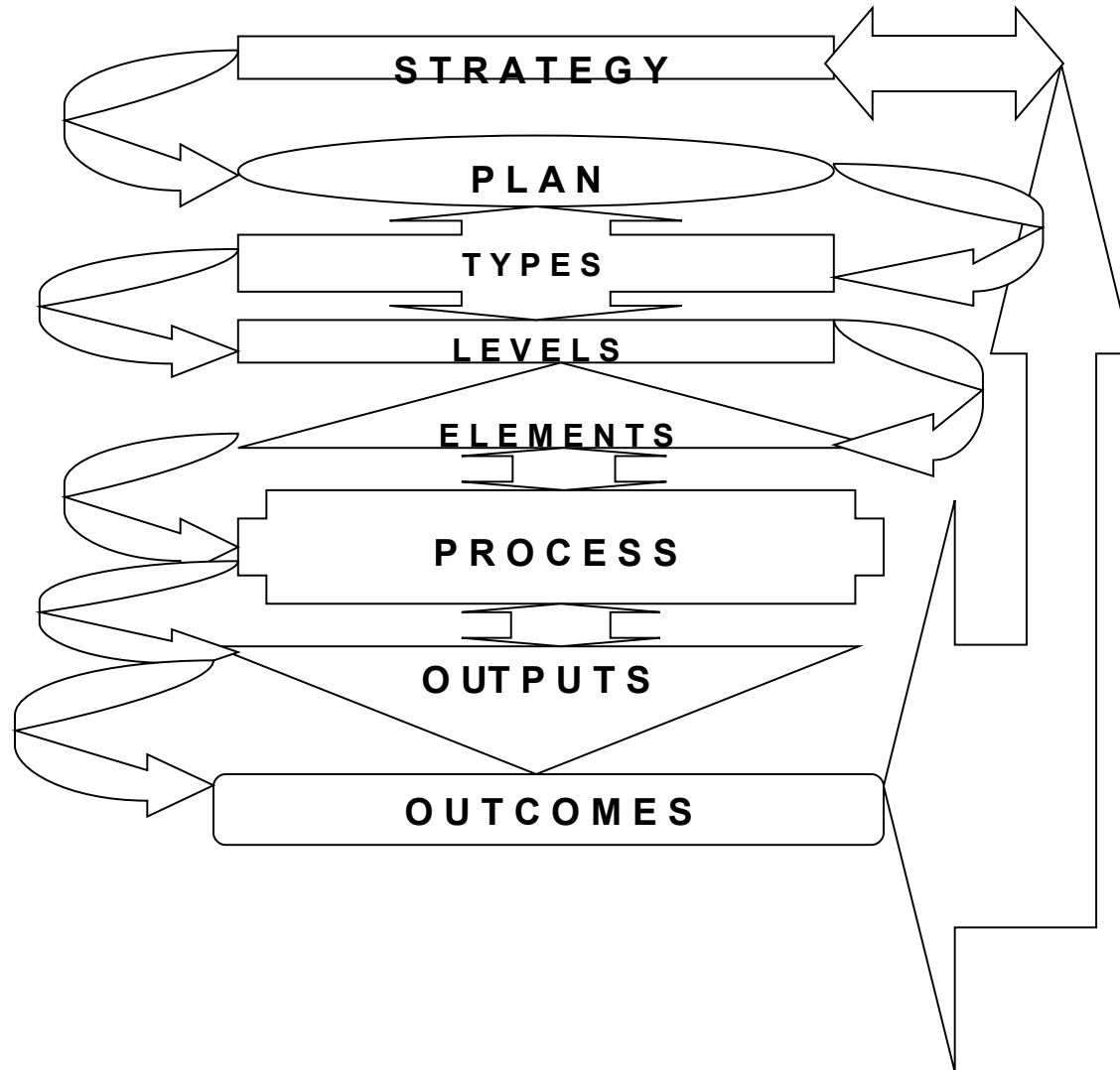


- Fig.6 Complete Learning Cycle adapted from 'Outcomes of dual cycle action research'. p.57 McKay and Marshall 2001, Dual Imperatives of Action Research
- In Fig.6 We apply Sustainability Theory(F) and Two Methods Research Method(MR) and Problem Solving Method(Mps) to a real Problem area i.e. Challenge of Sustainability in the Ghana Institute(P), which enable us to learn about The Sustainability of Postgraduate ICT Education and Higher Education. The Intervention is through Action and Reflection. reflection unlike Fig. 5 is not only restricted to the research process, and what to learn about F ,Mps, and MR, but also on F, MR,A, related to the research aspects whilst at the same time reflection on the Practical problem of the Ghana Institute and the improvements method there i.e. P and Mps respectively. In this sense, the end result of the learning which will be specified at the end as findings will be what has been learnt about everything, namely Sustainability theory/framework(F), Practical sustainability problem at Ghana Institute(P), Research Method (MR), Problem solving Method (Mps), the area or Body of Knowledge i.e. Sustainability of Advanced ICT Education/Higher Education (A). Being ready for uncertainties, tinkering/ bricolage are introduced as improvised solutions to emerging challenges (I).In this context, after a few cycles of action research, The Researcher can exit the research for PhD purposes, But the process of action research (Mps) continues as part of the Ghana Institute system. Of course being part of the Institute, Researcher will continue further Action research (MR) and activities in this area even after the PhD.

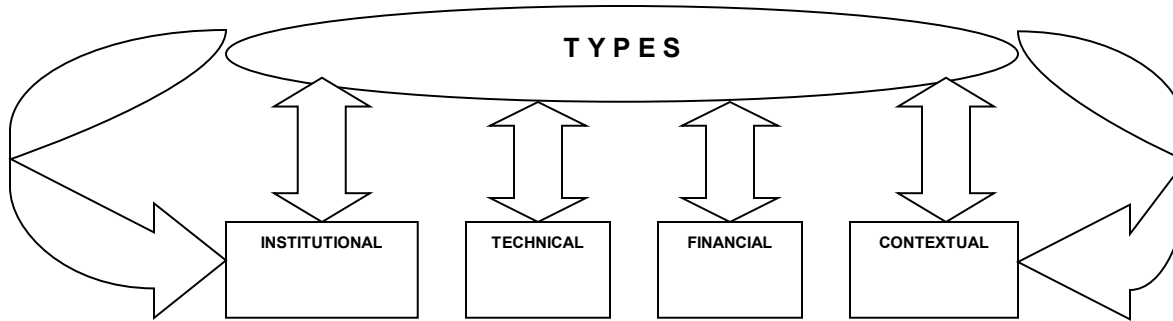


- **A Framework for Sustainability**
- **This Framework has been synthesized from definitions, Themes, Concepts, Theories of sustainability in our literature review. This review led to eight key ‘pillars’ of Sustainability which make up our framework. These are Sustainability Strategies, Plans, Types, Levels, Elements, Processes, Outputs and Outcomes. The Outputs and Outcomes together represent sustainability results (outputs standing for periodic tangible results and the Outcomes the overall end results).**
- **These pillars will be our areas of Investigation in the study, featuring in the action research process exhibited in figures 2-6**
- **In this context the Framework is F. it will be applied through the Method, action research(AR) process(M= MR,Mps,) with the help of a ‘grounded’ approach as indicated to learn about and change the Area/Theory/Framework of Sustainability(A), and The specific sustainability issue/problems in The Ghana Institute(P), and to generate Findings-sustainability outputs/outcomes about F, P,M(Mps, MR),A, Action, research entry and exit, improvisation and AR itself. Whereas F consist of several areas of Organizational dynamics, its application to assist in learning especially about P and A as a conscious and deliberate effort, is of much significance.**
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- **F too is the means of entry into the Canonical AR using a ‘grounded’ approach.**
- **Each of the pillars of F can be subdivided into smaller units. And these pillars will form the key outlines of our data collection, analysis and writing. It will be a framework also to structure the Findings and recommendations of the study.**
- **Graphically the framework is presented as follows:**
- **As Fig. 1.a, using indigenous concept of organization as a human body, with parts albeit, with many limbs (instead of hands and legs, limbs are used) to denote the ‘Akan’ (of Ghana) Metaphor of Man as an Animal ‘Aboa-Nipa’, literally meaning ‘animal-man’. A goat or Dog has limbs; viewed as limbs there are at least four. The Human body here is also depicted as ‘animal-man’ with many limbs. Many limbs denote several options, choices, means, opportunities, diversity, flexibility, and thus, the limbs representing parts of the body and diverse, with several options become the means for survival of the body. This body now, being the organization. Therefore, if we represent the Sustainability as such a body with several ways for survival, then it means that The Organization’s sustainability depends on having several options, several ways. This also means that no matter where we start, the goal of survival will be reached. So then we can even turn the framework upside down but the same goal will be reached. This is because like this caricature, an organization is in such a flux and this sort of fits very well with the concept of improvisation, which gives several options, for a social organ, like the ‘animal-man’ body which has several limbs and so can solve its challenges through different options.**
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- **As and when we subdivide the pillars into smaller units, other graphics will be developed to detail them such as FIG.1.b**

FIG. 1 'Aboa-Nipa' meaning 'Animal-Man' body of many limbs representing a Framework for Sustainability, although with many parts, it is also only one body-composite whole, to be viewed together as one.



- **FIG.1b.AN EXAMPLE OF SUB-DIVIDING A PILLAR IN THE FRAMEWORK T Y P E**
SINSTITUTIONALTECHNICALFINANCIALCONTEXTUAL



- **Data Collection and Sources**
- Qualitative data will be collected from sources such as Review documents and Literature, in-depth interview observation of the workings as a participant, of the Phenomenon of study, i.e. The Ghana Institute. Data gathered will be recorded in journals, pocket notebooks, tape recorders, cameras
- **Data Analysis**
- A general Inductive approach which allows themes to emerge from the raw data instead of imposing themes, and ignoring the obvious will be used for data analysis. It is also theory based and will help in developing the sustainability theory under consideration as it has characteristics similar to a 'grounded' approach. It also provides a clear linkage between research objectives, themes and findings of the research (Thomas, D.R. 2003). It is a straight forward approach.
- Under broad headlines of these themes, I will look at details of issues that relate to each of each theme. These themes and issues related or not related, will be used to guide which of the data will be used or not.

- **Digitizing Sustainability**
- There is an opportunity not only to apply sustainability to the ICT/IS field in this study, to digitize/automate the sustainability framework/process or aspects of it in a manner that will improve the Ghana Institute Systems, and learning to what extent digitization is possible in this action research, bearing in mind that not all Organizational processes lend themselves to routinization, and as a social system, several components undergo improvisation. The extent and areas of digitization will be determined as part of the action research process, in which in the real sense many things will change including the subject of study, the frame work, the process, and the researcher himself.

- **EXPECTED CONTRIBUTION TO KNOWLEDGE**

- It is expected that at the end, the research would have helped in:
- Understanding the challenges and opportunities for sustaining postgraduate ICT education in a developing Country.
- Developing a framework for improving sustainability of higher education and postgraduate ICT education in particular in a developing country.
- Documenting lessons learnt on sustainability from the Osei Tutu II Institute of Advanced ICT Studies in Ghana, which might be learnt from in setting up and managing such Institutions in Africa and the rest of the developing World.
- Getting opportunity to apply Sustainability concepts to the ICT/IS field, and digitize/automate sustainability in those areas of the Ghana Institute which lend themselves to such routinization.
- It is also expected that at the end, the practical actions would have also contributed to concrete improvements at The Ghana Institute in Institutional, Financial, Technical and Contextual areas of its sustainability.

CONCLUSION

The problem of Sustainability as it relates to Advanced ICT Education in a developing Country has been looked at, exploring how we may understand the nature and the extent of the problem, develop and implement an appropriate Framework for improving the situation of the Ghana Institute, using the critical interpretive action research to contribute to the body of knowledge. We found in the literature that much as the problem is indicated, and the subject of sustainability has been recorded here and there, it is not comprehensive, and therefore we will engage in a kind of ‘grounded’ research to see how this theory may be applied to the ICT/ IS sector.