7 CONCLUSION AND FINAL THOUGHTS

7.1 *Introduction*

This chapter presents an evaluation of contributions as well as my final thoughts on this learning journey. In Chapter 1, I laid out what I expected to be the contributions from this research. The questions that now need to be addressed by this chapter are: 1) what have been the actual contributions? and 2) what are the research limitations and therefore opportunities for future research? I address these two questions first before providing my conclusions and final thoughts.

But first I present a summary of the thesis by looking at the research questions and how they have been addressed through this research study.

7.2 *Thesis Summary*

1. Research Question 1: *What constitutes Botswana's ISD practice or how is ISD currently practiced in Botswana?*

   A description of current practice was provided through a review of secondary data (i.e. mainly the GIT Framework) as well as presentations that were made by the GITREP as well as the practitioners from both the government and the private sector during the change lab sessions. The analysis of current practice was carried out in the study through the use of the case project i.e. the PEX project, and this is what has been presented and described in Chapter 5 of the report. Furthermore, during learning action 1, an empirical analysis of current ISD practice was presented using the activity system model in terms of the object, subjects, tools, rules, community and division of labour (refer to Figure 15). The historical analysis of current ISD practice together with current contradictions was also carried out and has been presented at Sections 6.31.and 6.3.2 respectively.

2. Research Question 2: *What are the users and IS professionals learning and is the learning effective?*

   The findings from the post implementation review reported learning by users as dependent on whether users were new to computers or had prior knowledge of computers. Those that were new to computers reported learning on the use and value of IT and those with prior knowledge of computers reported learning on how systems could be developed through the ISD process and on business process improvement. But despite this reported learning there

was slow system uptake which was in contradiction to the reported learning. Developers on the other hand reported learning on the project environment as well as on how to manage clients in different settings.

The analysis of the effectiveness of learning on current ISD practice was done retrospectively using the heuristic model on two types of learning (i.e. conscious vs. unconscious learning) and the conclusion was that current learning was not effective since most of the learning actions / tasks tended to emphasise unconscious learning. The analysis and conclusion have been presented at Section 6.3.3 and more specifically Table 14.

3. Research Question 3: *How can current practice be improved in order to facilitate effective learning?*

   The answer to this research question has been provided through the redesigned ISD practice model that incorporates learning evaluation checkpoints. The co-design process which culminated in this model is described in detail at Sections 6.4 and 6.5.

4. Research Question 4: *What do users and IS professionals learn when collaborating in the review and redesign of ISD practice?*

   This sub-question is addressed through the extensive discussion which is presented at Chapter 6 which is mainly based on the two change lab sessions that were held with participants from government and the private sector, which also included users. A summary of what is learned is also included at Section 6.6 and 7.3.2

7.3 *Evaluation of Contribution*

7.3.1 **Contribution to (ISD) Practice**

The contribution to ISD practice is linked to the response to the third research question i.e. “How can current practice be improved in order to facilitate effective learning?” This has been achieved through the collaborative review and design of a new Botswana ISD practice model that includes learning evaluation checkpoints as well as readiness assessment and more focused change management activities. The collaborative redesign sessions offered an opportunity for participants from government and the private sector to actively engage in looking at possibilities for improving current practice. This is something that had not been done before.

The opportunity to reflect on the learning at each stage of the ISD process is viewed as critical to achieving effective learning. Reflection will make social actors aware or conscious that they are engaged in a learning activity as part of the ISD process. This awareness will contribute significantly towards achieving effective learning and this will manifest itself in higher levels of system uptake and significant work improvement.

The application of this model, because of its general nature, can be extended to global practice. In fact it would be interesting to test this model in research contexts outside Botswana.

7.3.2 Theoretical Contribution

This research has made theoretical contribution to IS research, learning and more specifically expansive learning studies.

Contribution to IS Research

There are very few IS research studies that have been carried out in Botswana that are of a practical nature, using a real-life case project with participation from government and the private sector, similar to what has been carried out in this research. This study is therefore a welcome addition to what little has been done in the past. Theoretically it provides an example of how IS research of a practical nature can be conducted using CHAT / expansive learning concepts similar to what has been achieved in Europe and other parts of the world.

Contribution to Learning / Expansive Learning

In terms of contribution to learning, it was possible to use Rogers (2003) and Malcolm et al.'s(2003) heuristic tool on two types of learning as a yard stick to retrospectively analyse the effectiveness of current learning in ISD. This I believe has provided an example of how this heuristic tool can actually be applied in practice. This tool was also useful in providing an additional theoretical tool to use to stimulate discussion and dialogue around improvements that needed to be made in order to facilitate effective learning. This is something that had never been attempted before.

On expansive learning, the research provides a further example of how CHAT and expansive learning concepts can be applied in real-life situations to analyse work practice and also to stimulate learning following the expansive learning cycle. The findings from analysing learning

by users and developers as they engaged in the review and redesign of ISD practice (i.e. in response to the fourth research question) was that of 1) learning as collective and distributed agency and 2) learning as expansion of the object in a number of dimensions.

Learning as Collective and Distributed Agency

The collective and distributed agency of the object was demonstrated during the collaborative redesign sessions. I initially triggered the questioning, but in the latter stages of the research – the object had moved from an individual object to a collective object as participants began to embark on a journey across the unchartered terrain of the zone of proximal development to find a solution to the current learning problem. This resulted in the formation of a new and expanded pattern of ISD activity which included learning evaluation checkpoints. The addition of learning checkpoints is new to ISD practice. The expansion of the object and the corresponding new pattern of activity brought about collective and distributed agency as demonstrated during the change lab sessions (Engeström & Sannino, 2010).

Learning as Expansion of the Object in multiple dimensions

During examination of the model it was interesting to observe expansion of the object in the systemic-developmental, moral-ideological, and anticipatory-temporal dimensions as identified by Hasu (2000) and Engeström (2000). This is interesting because examination of the model was being done in a change lab session and not during implementation and yet even then it was possible to observe these areas of expansion. This implies that there may be different levels of expansion of an object depending on the phase or stage of the expansive learning cycle. This represents a new insight with regards to expansive learning studies. It should therefore still be possible to trigger and observe similar object expansion dimensions during the testing and implementation of the model or even during the other subsequent phases of the expansive learning cycle. This could be done by using the same guideline questions that were used in the examination of the model to stimulate thinking, discussion and learning.

7.4 *Methodological Contribution*

In terms of the methodological contribution, this research has provided further insight into the application of DWR as a research method. One of the reasons that DWR was selected over action research was that it does not stipulate fixed actions or fixed starting and end points (Engeström and Sannino, 2010). In this research study it was only possible to carry out four out of the seven DWR epistemic learning actions shown at Figure 10. Despite this, the findings and contributions are deemed useful since there has been evidence of learning as outlined above.

Four other notable methodological contributions are that 1) a case project rather than an ethnography was used for the initial scoping, 2) examination of the model was done outside practice, 3) only two long change lab sessions were conducted instead of six or seven short sessions and 4) as the researcher / interventionist I was also one of the IS practitioners that was involved extensively in the PEX project.

Use of a Case Project as opposed to Ethnography

Most DWR studies start with an ethnography for the initial fieldwork. In this study an ethnography was not done instead a case analysis plus some interviews were used. This, in my view, provided adequate information from which the study frame or space could be defined and used to trigger the learning challenge of questioning current practice and remodelling it. This therefore means that one is not limited to ethnography in order to use DWR as a research methodology for studying learning activity. This was probably made easier by the fact that I had been following the problem for 21 years! What seems to matter is to have sufficient information, whether from ethnography or a case as demonstrated in this research project, to be able to lay out or outline the research problem space as well as to provide a basis for the subsequent activities of questioning, modelling and examining the new solution. The case data provided me the depth of information I required to define the problem space in terms of who the key social actors were and what some of the current issues and challenges were from the perspective of the users and developers. This therefore formed the basis for triggering the expansive learning cycle.

Examination of the model outside practice

Also in this study, I was able to use the four dimensions of learning as suggested by Hasu (2000) and Engeström (2000) during examination of the model and not at implementation as was the

case during their respective studies. Analysing learning at this stage revealed that a guideline question could have other dimensions embedded in it – or that the dimensions are not fixed dimensions. There is a constant movement throughout the zone of proximal development and therefore the dimensions of object expansion are in a flux. This further shows the variability and flexibility of application of expansive learning concepts.

Change Laboratory Sessions

The other methodological deviation was that two long change lab sessions were held, instead of six or seven two hour sessions because of concerns over the availability of participants. It would not have been possible to achieve the same level of interest and participation in the research activity had I opted for more sessions. Although the time between these sessions was long – it was still possible for participants to engage with the object and dialogue and think through how practice could be improved. This indicates that there can be flexibility in the CL design and approach which depends on the social context of the study and the practicalities on the ground.

Researcher / Interventionist and also IS Practitioner

Most of the DWR / expansive learning studies found in literature were conducted by researchers who were not themselves engaged in the specific work activity they were researching on. In this particular research I was a researcher / interventionist and practitioner engaged in the ISD activity daily (i.e. I assumed both an insider and outsider role). The question that arises then is how have I been able to deal with these two distinct roles and how has this influenced the research process and the findings. My role as both researcher and practitioner was articulated upfront and acknowledged in the research methodology (Section 4.4). I was therefore conscious throughout the research process that as an insider I did not bring my own individual biases into the analysis. I think that my dual role has enhanced the process rather than influence it since I was fully engaged with the rest of the participants in the learning challenge of redesigning new practice.

Throughout the process I tried to be '... open, authentic, honest, deeply interested in the experiences of one's research participants, and committed to accurately and adequately representing their experience' which is what is important in any qualitative research study and not so much that one is an insider or outsider (Dwyer & Buckler, 2009). In this study I have

clearly outlined my three roles. As insider I participated in the development of the PEX system as an analyst and later as a project manager. As an outsider and also interventionist I facilitated the change lab sessions as well as carried out the data analysis. Furthermore as an interventionist, I made suggestions during the CL sessions on the inclusion of the learning evaluation checkpoints. But, though it was difficult, I allowed the participants to openly discuss my suggestions without any interference from me – at that point during the change lab sessions I assumed the role of facilitator. My clear awareness of the complexity of assuming the dual role of insider-outsider made it possible to manage my dual role which has contributed to the validity of the findings.

7.5 *Research Limitations and Opportunities for Future Research*

Although there have been some notable contributions to practice and theory, there have also been a number of research challenges and limitations that I will discuss in this section i.e. 1) stakeholder participation and interest, 2) testing and implementing the model in real life 3) analysis of other interconnecting activity systems.

Stakeholder Participation and Interest

The biggest challenge for this research was to get all concerned stakeholders to participate fully – initially GIT was fully supportive, but once there were transfers and restructuring within that department, the momentum and the interest was lost. The management changed and as result of that the support and interest was lost. The impact of this is that it was not possible to identify a real-life project on which the new practice model could be applied and tested. Pihlaja (2005) also battles with similar questions with regards to the application of DWR and expansive learning:

> *'The developmental method applied in the Change Laboratory emphasises learning on the shop floor with the support of top managers. The empirical case highlighted the central role of the planners and designers, however, who resisted the new form of learning. The question thus remains of how to engage the designers in these kinds of projects. To what extent would it be possible to carry out the cycle of expansive learning in delivery work without changing the other related activities at the same time? If it is possible to produce the kinds of innovation and collaboration discussion above within the Change Lab, where in the larger organisation and by whom should the change be initiated, and how could the results be integrated into the established practices?'* (Pihlaja, 2005, p. 230)

Carrying out this research study was an ambitious task for me, because I was trying to influence changes to a process or practice that was perceived to be fully owned by government. I wanted to bring the private sector on board so they could also share some of the responsibility of IS failures and thereby collaborate in seeking a solution to the problem. But, as was anticipated, getting sustained interest from the private sector was also a challenge, especially because changing the process was not a priority for them.

Any future research that seeks to bring government and industry together in collaborative review and redesign of practice will need to find means and ways of ensuring sustained participation and interest from the two subject groups.

Testing and Implementation of the Model

Another limitation of the study is the fact that it was not possible to report on the testing and implementation of the model. It is expected that during the testing and implementation of the model longer CL sessions as well as more sessions will be held because at that stage the participants will be confined to a specific project with specific users and developers as opposed to representative users and developers as was the case in this current study. This, however, presents an opportunity for future research in terms of carrying out and analysing learning during the remaining three epistemic learning actions of implementation, reflection and consolidation.

Analysis of other activity systems

The research design did not provide for analysis of all the activity systems making up the network of activities (i.e. Finance activity, procurement activity, subject-producing activity, tool producing activity etc), as the focus was on the two interacting activities of users and developers. It will be interesting to study, for example, the subject producing activity system to see whether Botswana institutions are producing reflective practitioners and the impact of that on the ISD process. What would one describe as the attributes of reflective practitioners in the context of Botswana and how does that differ with the global context if at all? Would, for example reflective practitioners be more facilitative of the learning that is required in order to avoid IS failure?

7.6 *Final Thoughts*

This research study has been an interesting journey for me as I went through a process of dialectical thinking and expansive learning. The journey began when I, as an individual and practitioner within Botswana's ISD practice, began to question the current practice, especially with regard to issues of learning and system uptake. It moved from an individual quest to the collective as I designed this research study that would involve other practitioners from the government and private sector (as well as users) in the collaborative analysis and modelling of the zone of proximal development of ISD practice.

At the time when I started, I was not aware of activity theory and its utility as a framework that combines work and development. Activity theory was introduced to me through a paper that was given to me by my supervisor sometime in 2007. On reading the paper I felt that I had at last found something that could address my research objectives. I therefore began a journey of knowledge assimilation and learning as I conducted further research on CHAT and related concepts.

It has been an individual journey of questioning-analysing-modelling-examining and implementation as I questioned the suitability of CHAT and more specially DWR as a research methodology. I also questioned whether expansive learning concepts were on their own sufficient to analyse current learning challenges in ISD practice. This analysis led me to conclude that I would have to look at other learning theories. I therefore began to model an approach that also included concepts borrowed from other learning theorists. The modelled approach included the use of the two types of learning by Rogers (2003) and Malcolm et al., (2003) which interestingly are also encapsulated in Leontiev's hierarchy of activity i.e. activity comprising of conscious actions and unconscious operations. This discovery increased my horizon of the zone of proximal development.

During the write-up and the change labs I was constantly examining my own thinking process in terms of whether the research approach and concepts adopted were right for this type of study. The fact that I was able to bring IS professionals together to introspect and analyse current practice led me to conclude that the approach was indeed suitable. I now leave it to the rest of the academic world to test the applicability of my findings.

As a research work I have thoroughly enjoyed the journey through the zone of proximal development, as I together with other participants from government and industry explored and developed a solution to improve current ISD practice in Botswana!