Title:	Planning for Action Research: Looking at Practice through a Different Lens
Author(s):	Hahn, Heidi A.
Intended for:	16th World Multi-Conference on Systemics, Cybernetics and Informatics, 2012-07-17 (Orlando, Florida, United States)

Planning for Action Research: Looking at Practice through a Different Lens

Heidi Ann Hahn, Ph. D.
Engineering Sciences Directorate, Los Alamos National Laboratory
Los Alamos, NM, 87545, USA

ABSTRACT

It has been my experience that behavioral science practitioners, including myself, often "back into" action research. That is, we start out doing a process improvement or intervention and discover something along the way – generalizable knowledge – that seems worthwhile to share with our community of practice. What if, instead of looking at these projects from the point of view of practitioners, we looked at them as research from the outset? Would that change the outcome or generate additional knowledge? This paper compares and contrasts process improvement and action research methods, and illustrates how use of a research "lens" can enhance behavioral science interventions and the knowledge that may result from them.

Keywords: Action Research, Process Improvement

1. INTRODUCTION

Action Research, as defined by Kock (1) simultaneously improves the subject of study and generates knowledge. The Action Research paradigm is used in evaluating social science interventions, such as educational initiatives, organizational development efforts, and behavioral health programs, or the effectiveness of changes to systems with humans in the loop, such as human-computer systems or enterprise business systems.

It has been my experience, however, that behavioral science *practitioners*, including myself, do what I call "backing into" Action Research. That is, we start out doing a process improvement or an intervention rather than a research project, but discover something along the way – generalizable knowledge – that seems worthwhile to share with our community of practice. I contend that, had we conceived of our efforts as research from the outset, our contributions to the body of knowledge would be more robust and the utility of our projects would improve as well. In this paper, I briefly discuss two projects that I have been involved with at the Los Alamos National Laboratory (LANL) that illustrate these points.

2. A COMPARISON OF ACTION RESEARCH AND PROCESS IMPROVEMENT METHODS

First, I will describe the classic Action Research methodology put forward by Gerald Susman and Roger Evered in 1978 (2) and contrast it to a typical process or product improvement cycle, such as PDCA or Plan-Do-Check-Act that was derived from W. Edwards Deming's work (3) beginning in the early 1950's. As shown in Figure 1, Susman and Evered's Action

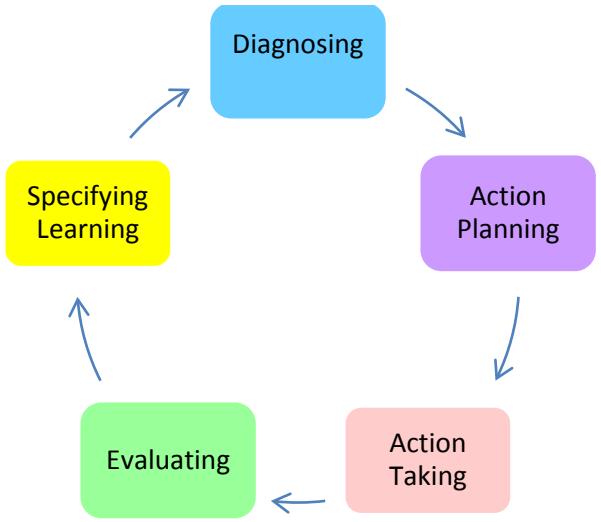

Figure 1. Action Research Cycle [1]

Research Cycle comprises five stages: diagnosing, action planning, taking action, evaluating, and specifying learning. Specifying learning may then lead into a new diagnostic process.

In Diagnosing, an improvement opportunity or a general problem to be solved is identified. Action Planning considers alternative courses of action to attain the improvement or solve the problem. Action Taking involves selecting and implementing a course of action. Evaluating involves the study of the outcomes of the selected course of action. Finally, in Specifying Learning the outcomes of the evaluation stage are reviewed and knowledge is built by describing the situation under study. The output of Specifying Learning may lead to additional iterations of the cycle, serving as input to a new diagnosis.

As the name implies, the PDCA quality management cycle is a four-step process. In the Plan step, the targeted improvement and the output expectations are identified. In the Do step, the change is implemented and data needed to confirm or refute the satisfaction of the expected output is collected. In the Check step, the actual results collected in the Do step are compared to the expected results. In the Act step, the causes of differences between actual and expected results are analyzed. Corrective actions may be requested, leading to another iteration through the PDCA cycle. Corrective actions most often take the form of additional improvements to the product or process under study, however, it is also possible that the goal state will need to be altered based upon improved information. Figure 2 provides a representation of the PDCA cycle.

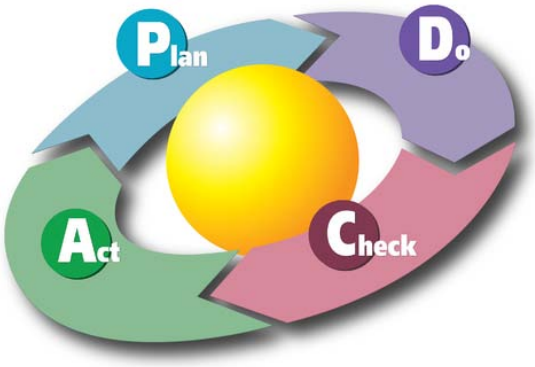

Figure 2. The PDCA Cycle[1]

On the surface, it appears that the primary difference between Action Research and process improvement is the inclusion in Action Research of the step "Specifying Learning." And, it is true that the PDCA cycle generally limits knowledge-sharing to the enterprise rather than contributing to the generalizable body of knowledge. However, the differences are actually deeper and more subtle than that.

Although both paradigms sound a lot like the scientific method, they are epistemologically different. The PDCA cycle is built on a positivist epistemology. Positivists generally assume that reality is objectively given and can be described by measurable properties that are independent of the researcher. Positivist research is characterized by formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population (4).

In contrast, Action Research reflects an interpretive epistemology. Interpretivists generally attempt to understand phenomena through the meanings that people assign to them. Interpretive research does not predefine dependent and independent variables, but focuses on making sense of emerging situations (5). Generally, practice- or theory-based questions, rather than formal hypotheses, are used to guide the data collection and analysis.

This difference in perspective influences the types of data collected in the two paradigms. Generally, the data used in PDCA is quantitative and focused on attributes of the process or product. In Action Research, observation of participants, surveys, and interviews are the most common data collection methods. This is not to say that the methods are strictly limited to either quantitative or qualitative data. In PDCA, for example, qualitative assessments of the subjects' perceptions of the "goodness" of the process or product may also be performed. In Action Research, quantitative measures, such as throughput of an educational intervention, may supplement more subjective or qualitative metrics. But, the preponderance is toward quantitative data for PDCA and qualitative data for Action Research.

One final important difference between the two paradigms is with respect to the relationship between the researcher and the subjects of the study. A hallmark of Action Research is tight collaboration between the researcher and the individual, group, or organization that is the subject of the improvement opportunity (the "client"). This occurs in all steps, with the possible exception of Specifying Learning, which may be the sole responsibility of the researcher. In positivist research like PDCA, the practitioner is more likely a detached spectator, and the client is an object to study (2).

3. LOOKING THROUGH A DIFFERENT LENS

My *Proceedings* paper (6) titled "Adapting the Case Model Approach for Delivery of Engineering Ethics Professional Development Units (PDUs)" provides an example of how using an Action Research process when planning a project can make for a more robust contribution to the body of knowledge. In the paper, I allude to the fact that we hadn't really thought ahead to what questions we might have asked or what data we might have collected that would have made our knowledge contributions about case methods more valuable. We essentially used a PDCA-like paradigm – the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model from the Systematic Approach to Training – at the start of the intervention.

As a result of our process improvement frame, our success metrics were all quantitative – things like the percentage of the target population who had completed the courses and the pass rates for the case study segments. We did not survey the participants about the efficacy of online delivery of case studies, so are left with unanswered questions such as whether the trainees found the case method to be pedagogically more appealing than traditional lecture-based methods, as we had theorized, and whether the branching incorporated into the instructional design is an adequate surrogate for the feedback provided via dialogue in traditional face-to-face case methods.

What would the project have looked like had we used an Action Research lens instead?

- Our diagnosis would have been the same – we needed to provide PDUs for our target audience and we hoped that they would refresh their knowledge on engineering ethics principles as a result of their experience with the intervention
- Our action planning and action taking would also have been the same – the literature on adult learning and some of our cost and logistical requirements guided our choices
- Our evaluation, however, would have been different, as we likely would have included explicit consideration of the pedagogical value of our intervention

[1] Attribution for Figure 2: By Karn-b - Karn G. Bulsuk (http://www.bulsuk.com). Originally published at http://www.bulsuk.com/2009/02/taking-first-step-with-pdca.html (Own work) [CC-BY-SA-3.0 (www.creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons

- As a result, our specifying learning would have had added value

Another Action Research project that I was involved with that also was framed initially using a practitioner mentality provides many good examples of how the effectiveness of the interventions would have been improved had an Action Research framework been used to plan them. The project is the LANL's Enterprise Project – the implementation of a commercial off-the-shelf enterprise resource planning or ERP system to replace the home-grown business computing systems that had been in use since the early 1980's. My role was as Deputy Project Director for Change Management, responsible for human factors and organizational aspects, process engineering/reengineering, procedures development, training, and sustainment processes to assure that the implemented system was accepted and used. In the next several paragraphs, I describe our approach to stakeholder management for this project, what we would have done differently had we planned using an Action Research lens and what outcomes might have been different had we done so. The results are based on a rigorous lessons learned process that the project team exercised following each software release.

Because the Change Management Team had, as its highest level requirement, the transition of the system from development to acceptance and use in the operational environment, our focus was necessarily on the transition, that is, the processes that people go through to adapt to new situations (7). We also sought to understand the activities and artifacts that would be needed to move the stakeholders from a state of commitment to legacy systems to a state of acceptance and adoption of the ERP system. This necessitated thinking about transition as a process, not an event. We relied on the change management literature to inform the interventions.

Elizabeth Kubler-Ross (8) introduced the model shown in Figure 3 as a way of understanding the stages that people go through to cope with death and dying. On learning that they or a loved one is terminally ill, the initial emotional response if often immobilization or not knowing what to do. This may segue into denial, anger, bargaining, and depression before a person can begin to test new alternatives and accept the situation. This model was adopted as part of the project's change management framework, as it proved useful in understanding the emotions being experienced by those being affected by change. It served as the basis for recognition on the part of the Change Management Team that there exists a life cycle of sorts to transitions: people involved in the transition must move through the Awareness-Understanding-Acceptance-Commitment curve shown in Figure 4.

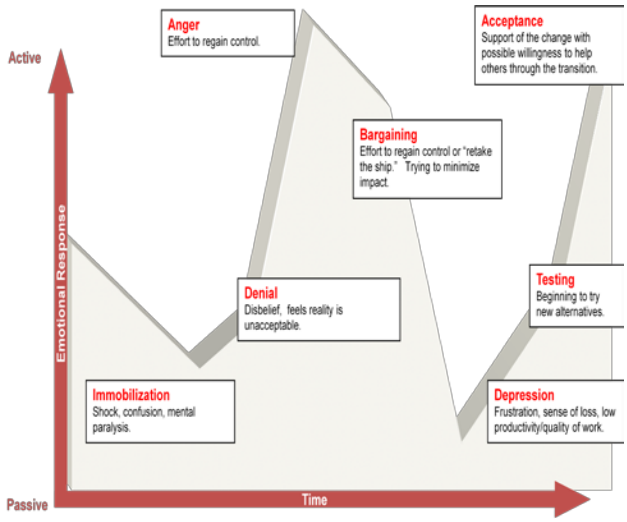

Figure 3. Kubler-Ross's Coping Stages

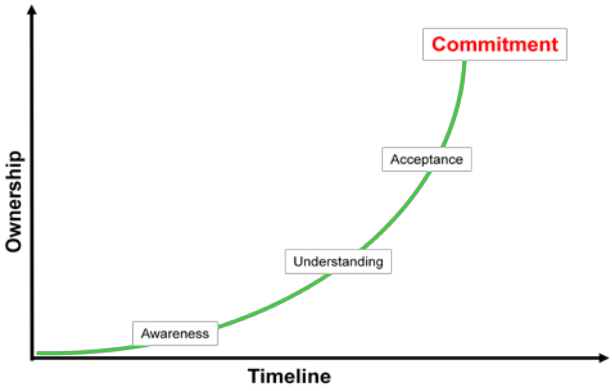

Figure 4. Awareness-to-Commitment Curve

Burke (9) describes four stages: pre-launch, launch, post-launch, and sustaining, which roughly correspond to the stages represented on the Awareness-to-Commitment curve. Used in combination with recommendations provided by Kanter, Stein, and Jick (10), Burke's model suggested a variety of activities that could be used to prepare LANL workers for the change deal with resistance, and sustain the ERP implementation, effecting movement through the Awareness-to-Commitment curve.

As shown in Table 1, during the pre-launch phase, activities revolve around understanding the culture, articulating the need for change, developing shared vision, and planning for the change. In the launch phase, the change is communicated and implemented. The focus of the activities in the post-launch phase is dealing with resistance to change experienced after the launch. Finally, in the sustaining phase, progress is monitored and needs for additional changes are identified. In many ways, this is similar to the PDCA cycle previously described.

Table 1. A framework for managing change (Adapted from Burke [9])

Stage of Change	**Pre-launch**	**Launch**	**Post-Launch**	**Sustaining**
Activities (some as suggested by Kanter, Stein, and Jick [10])	▪ **Communication** – Establish the need for change – Develop shared vision ▪ **Planning** – Assess culture – Determine organizational readiness – Determine accountability & responsibility – Review policies & systems – Plan for measurement & evaluation	▪ **Communication** – Describe the changes ▪ **Implementation** – The release is issued – Leave room for local participation and innovation	▪ **Addressing resistance to change** – Conduct team building/ organizational development	▪ **Progress monitoring & continuous improvement** – Implement standards, measures, & feedback mechanisms ▪ **Solidifying the new ways of working** – Provide rewards
Desired Outcome	**Awareness**	**Understanding**	**Acceptance**	**Commitment**

Connor (11) described nine classic factors that contribute to resistance to change:

- lack of trust
- belief that change is unnecessary or not feasible
- economic threats, including the potential for loss of income due to job loss or de-enrichment
- relative high cost of implementing the change versus operating according to the status quo
- fear of personal failure
- loss of status and power due to no longer being the expert on the system and processes
- threat to values and ideals and
- resentment of interference from those chartered to implement the change.

These were used in a diagnostic sense, trying to understand how different stakeholders would experience the different resistance factors to inform the selection of interventions.

Lessons learned on our stakeholder management approaches yielded understanding both of things that we would continue and of things that we would discontinue or change.

So what were the results? On the positive front, using Connor's (11) resistance to change factors as a diagnostic allowed us to better understand the requirements for the interventions that we would be designing. For example, although we understood from the outset that field staff would require training on the new system and processes, having an understanding about their fear of failure – which was rooted in a fear that they would not be able to serve their customer to expected levels – influenced not only the design and implementation of the training (which occurred in a sandbox environment, prior to launch, far from the eyes of supervisors or customers), but also the support systems that were deployed with the ERP functionality.

Similarly, use of the Awareness-to-Commitment Curve and Burke's (9) model in tandem brought a positive benefit. Specifically, it raised our awareness that there were transition-related requirements that needed to be executed far upstream from the transition itself and suggested both timing and content requirements. Perhaps the most impacted area was the communications campaign, which was initiated well before the details of any particular release were specified. Initial messages were around changes unfolding (see Figure 5), and were intended to arouse awareness and curiosity; these were followed up with increasingly detailed communications about the impacts of particular releases on affected stakeholders as the launch of the release neared.

Figure 5. Enterprise Project Poster

Both the Awareness-to-Commitment Curve and Burke's (9) model also led us astray, however. Our derivation of the Awareness-to-Commitment Curve overlooked the emotional equivalent of the disposal phase of the system life cycle of the legacy system, namely, that people had to let go of the legacy system in order to accept the ERP. The transition-related requirements should have included activities and artifacts that would have facilitated letting go, by acknowledging the contributions of the legacy systems and the people associated with them.

Further, in some ways, we allowed the change management literature to become a surrogate for actual engagement of stakeholders regarding their wants and needs with respect to the activities and artifacts that would support transition. Said another way, we became "book smart" and, as a result, engaged in a few activities that were inappropriate for our situation. One example was our pursuit of organizational readiness assessments, as suggested by Burke (9) as a pre-launch activity. Rather than serving as a source of valuable information that would help in the design of the interventions to be executed during later stages, this aroused suspicion on the part of the stakeholders surveyed and actually increased the resistance to the project.

Looking at the project from an Action Research context, we would say that our diagnosis involved the need to bring stakeholders through the awareness to commitment curve. The action planning was the application of Burke's (9) model and Kanter, Stein, and Jick's (10) recommendations to generate interventions. Action taking was the selection and implementation of those interventions. Evaluation was our lessons learned exercises, and specifying learning occurred in the various conference papers and other publications and presentations that have stemmed from the project.

In this case, then, we fulfilled all of the steps of the Action Research cycle. What we missed was the collaborative relationship with participants and the in-process observation, qualitative data collection, and interpretivist perspective that characterize Action Research.

Had we used an Action Research lens in planning and implementing the stakeholder interventions, we could have been more effective and avoided some of the problems we experienced. For example, with respect to identifying and dealing with resistance to change, taking an Action Research perspective would likely have predisposed us to include elicitation methods, such as "listening sessions," geared not so much toward the capture of stakeholders' formal requirements but toward hearing their underlying concerns. This would have not only had the benefit of identifying stakeholders' concerns earlier, affording an opportunity to deal with them sooner, but the collaborative relationship would also have helped build trust, eliminating one of Connor's (11) resistance to change factors.

Taking the collaborative perspective of Action Research, rather than the practitioner/observer perspective, would have helped in other ways as well. If we had put ourselves into the shoes of the participants, we would have recognized the need to address requirements related to release of attachments to the old system as well as to acceptance and use of the new system. Knowing the LANL culture, the resistance to the organizational readiness assessment should have come as no surprise; however, we were swayed by the advice of outside experts that was abstract from the reality of our situation. Collaboration with the participants in the design of the interventions would have revealed the resistance, and most likely would have resulted in a re-think of implementing that particular intervention, avoiding the aroused suspicions discussed above.

4. CONCLUSION

Looking through the lens of Action Research when planning social science interventions or process improvement initiatives can both enhance the effectiveness of the initiative and improve the value of the resulting contributions to the practitioner community's body of knowledge. In particular, the collaborative relationship between researchers and participants in Action Research is helpful in identifying resistance to change, building trust, and designing interventions that will be accepted by the intended audience.

5. REFERENCES

(1) Kock, N. Action Research: Its Nature and Relationship to Human-Computer Interaction. In Soegaard , M. and Dam, R. F. (Eds.). **Encyclopedia of Human-Computer Interaction.** Aarhus, Denmark : The Interaction-Design.org Foundation, 2011.

(2) Susman, G. and Evered, R. An Assessment of the Scientific Merits of Action Research. **Administrative Science Quarterly**, Vol. 23 (4), Ithaca, NY : Cornell University, 1978, pp. 582-603.

(3) Deming, W. Edwards. **Out of the Crisis**. Cambridge, MA : Massachusetts Institute of Technology, 1982.

(4) Orlikowski, W. J. and Baroudi, J. J. Studying Information Technology in Organizations: Research Approaches and Assumptions. **Information Systems Research**, Vol. 2, 1991, pp. 1-28.

(5) Kaplan, B. and Maxwell, J. A. Qualitative Research Methods for Evaluating Computer Information Systems. In Anderson, J. G. , Aydin, C. E. and Jay, S. J. (Eds.). **Evaluating Health Care Information Systems: Methods and Applications**. Thousand Oaks, CA : Sage, 1994.

(6) Hahn, H. A. Adapting the Case Model Approach for Delivery of Engineering Ethics Professional Development Units. **Proceedings of the 16th World Multi-Conference on Systemics, Cybernetics, and Informatics**, Orlando, FL, 2012, pp. 231-237.

(7) Bridges, W. **Managing Transitions: Making the Most of Change**. Cambridge, MA : DeCapo Press, 2003.

(8) Kubler-Ross, E. **On Death and Dying**. New York : Touchstone, 1969.

(9) Burke, W. W. The Organizational Change Leader. In Goldsmith, M., Govindarajan, V., Kaye, B., and Vicere, A. (Eds.). **The Many Faces of Leadership**. Upper Saddle River, NJ : Pearson Education, Inc., 1993.

(10) Kanter, R. M., Stein, B. A., and Jick, T. D. **The Challenge of Organizational Change: How Companies Experience It and Leaders Guide It.** New York : The Free Press, 1992.

(11) Connor, D. R. **Managing at the Speed of Change: How Resilient Managers Succeed and Prosper Where Others Fail.** New York : Villard Books, 1995.