Facilitating Change in a Health Care Setting:  
Effects of Comprehensive Leadership Training  
on the Creation of a Context-for-Learning in Hospital Nursing Shifts

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Abstract: When change is acknowledged to be not only an exogenous factor but also an endogenous factor, a leader’s role changes from protector to facilitator of change efforts. One way to facilitate change and learning is to create an organizational context that supports change. These factors of a Context-for-Learning and accepted leader behaviors are modeled via a computer simulation and the results for an organization which has received much directed leadership training is shown and compared to results for prototypical leader patterns. Similarities and differences are discussed with implications for practice highlighted.
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Leadership and learning are indispensable to each other. 
*John F. Kennedy (1917 - 1963), speech prepared for delivery in Dallas the day of his assassination, November 22, 1963*

This quote is forty years old and yet it is still critical today. Today’s organizational environments both internal and external remain in a state of flux. Such inherent changes can spark a refusal to change (Toffler, 1971) or we can deliberately take charge of the change process and convert it to a dynamic learning process. Indeed, having such an organization that is capable of rapidly and effectively responding to critical incidents has been called for in recent research (Comfort 2002). This is particularly the case in highly skilled knowledge industries such as health care organizations.

Whenever there are people involved, some of the more puzzling and hard to manage resources are the result of their interactions. Creating a context for learning is one such perplexing human system resource (Black & Boal, 1997; Black & King, 2000, 2001). In a human system resource, one needs to consider the nested resources and their influences to the whole systemic resource (Black & Boal, 1994). One needs to simultaneously consider leader-follower dynamics, follower-follower dynamics, and group-individual dynamics (Kisfalvi & Pitcher, 2003; Aldrich, 2003; Murrman, 2003). Again, nowhere is this more critical than when examining the socially-created resources and competencies used in creating and maintaining life such as found in hospitals and other medical care facilities.
However, such medical systems have been recognized as belonging to a class of complex systems (Anderson & McDaniel, 2000; Ashmos, Duchon, McDaniel, & Huonker, 2002). When nested into critical response systems for terrorists attacks or natural disasters (Comfort, 2002) the complexity rises even more. Attributes of complex systems include sensitivity to initial context, sensitivity to the specifics of who or what is in the system along with the dynamics of social interaction (or the relationships between elements of the system) (Gregersen & Sailer, 1993; Marion, 1999; Anderson, 1999; Anderson & McDaniel, 2000; Marion & Uhl-Bien, 2001). Although specific point predictions are not possible with complex systems, recent work has found that the principles, vocabulary and computer-based modeling tools of complexity theory are generally useful in explaining the dynamic cycles and patterns of organizational behavior (Marion, 1999; Anderson, 1999; Black & King, 2000; Sterman, 2000; Jacobsen, C. & House, R. 2001; Marion & Uhl-Bien, 2001).

For this paper, we have applied one of the most popular and powerful quantitative tools of complex system analysis -- computer based simulation modeling (Carley, 1995) to the issue of the effects of a practice of leadership training on nursing shift leaders and teams and their capability of creating a context for learning (Ghoshal & Bartlett, 1994; Black & Boal, 1997; Black & King, 2000, 2001). Using a computer model developed elsewhere (Black & King, 2000, 2001), the model takes inputs from organizational and leadership skill assessment surveys and generates simulated developmental paths of the Context-for-Learning. A summary of the major components of the model along
with the customization of the model for this setting including the operationalization of a consistent pattern of an investment in leadership training will be presented. Results of the site originated virtual experiments will be compared with the results from prototypical leader profiles inserted into the site groups.

**Computer Model Summary**

Specifically, we will utilize a virtual experiment to examine the impact of a leader’s behaviors on individuals in specific workgroup contexts as a socially constructed strategic resource is created. Others have created a computational model or computer simulation to examine the effects of follower-to-group, leader-to-group, and group-to-follower/leader dynamics (Bonner, Buamann & Dalal, 2002) on the development of a Context-for-Learning (Black & King, 2000, 2001). The direct effects of Leader-to-follower have also been linked to this base model (Black & King, 2001). This work has all been done using synthetic data and the model has not been examined using data from the “real” world in conducting virtual experiments. We extend this earlier theoretical work by examining the reasonableness of the simulation in modeling “real world” based virtual experiments.

We continue now with a more specific presentation of the constructs of interest and the relationships between these constructs used in the computer simulation. After the model’s development is described, the simulation will be run as a virtual experiment. The results from the virtual experiment will be presented
and discussed and the final section of the paper will address implications for future research and nursing management practitioners.

The Context-for-Learning Competence

One of the many socially created resources that have been posited as strategically important is organizational learning (Fiol & Lyles, 1985; Senge, 1990; Dodgson, 1993; Ghoshal & Bartlett, 1994; Nonaka & Takeuchi, 1995). Ghoshal and Bartlett in their rich case study identified four necessary contextual conditions present when the organizations in their study demonstrated transference of knowledge and thus successfully learned (Ghoshal & Bartlett, 1994). After operationalizing the contextual conditions via a questionnaire, Black and Boal also found these conditions of discipline, stretch, trust and support to be present in high performing work groups (Black & Boal, 1997). The questionnaire/scale operationalization each of the attributes by Black and Boal (1997) resulted in the following Cronbach’s alphas and using Goodness of Fit indices (Lisrel 8): **Discipline** – .87, GFI=.70, CFI=.70, NFI=.66 and IFI=.71; **Stretch** – .77, GFI=.84, CFI=.79, NFI=.74 and IFI=.79; **Trust** – .70, GFI=.93, CFI=.94, NFI=.89 and IFI=.94; **Support** – .87, GFI=.91, CFI=.93, NFI=.88 and IFI=.93. Black and King (2000) labeled this set of competencies, the Context-for-Learning and developed a computer simulation that demonstrated the transference from individual to group level understandings of the embedded constructs in the development of the Context-for-Learning. They based the emergence of the group level competence on expertise power relationships among work group members and position power relationships for those in a
leadership position. Black and King (2001) took that base model and added
directed leader activities based on Quinn’s Competing Values framework (Quinn
& Cameron, 1983; Quinn, Faerman, Thompson & McGrath, 2003). It is this
expanded simulation that forms the engine for the virtual experiments of this
paper. We will next discuss Quinn’s Competing Values Framework.

**Quinn’s Competing Values Framework**

Quinn and associates have developed an approach to analyzing and
viewing effective management from a competing value perspective (Quinn &
Cameron, 1983; Quinn, 1984, 1988; Quinn, Sendelbach & Spreitzer, 1991;
Quinn, Spreitzer & Hart, 1992; Denison, Hooijberg and Quinn, 1995; Quinn,
Faerman, Thompson & McGrath, 2003). The Competing Values Framework
model, which integrates four major historical models of efficient organizations
(Quinn, et al, 2003), identifies four general competing values and associated
roles. Control Value Systems (Producer and Director roles) compete with
Flexibility Value Systems (Mentor and Facilitator roles). Internal Focused Values
Systems (Monitor and Coordinator roles) compete with External Focused Value
Systems (Innovator and Broker roles). Each of these “roles” has been linked to
specific behaviors (Quinn, Faerman, Thompson & McGrath, 2003). Questionnaires
were developed to help diagnose an individual’s leadership style
(profile of behaviors used) from the level of skill for behaviors associated with the
roles and the frequency that each behavior is used. The CVF questionnaire has
demonstrated discriminant, convergent and nomological validity (Denison et al.,
1995).

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Quinn and associates have detailed some leader profiles and designated some as effective and others as ineffective (Quinn, 1988). The ineffective profiles are Chaotic Adaptives (relatively strong in facilitating, mentoring and innovating and weaker elsewhere), Abrasive Coordinators (relatively strong in monitoring and coordinating and weak elsewhere), Drowning Workaholics (weak everywhere but stronger in producing), and Extreme Unproductives (again weak everywhere but slightly stronger in mentoring and weakest in producing). The effective profiles are: the Aggressive Achiever (slightly weaker in facilitating and stronger in producing), the Conceptual Producer (weaker in monitoring and coordinating), the Peaceful Team Builder (weaker in producing and brokering) and the Master Manager (balanced skills in all roles). We used both these leadership roles and the profiles in our virtual experiments.

Black and King (Black & King, 2000, 2001) had developed the model linking both individuals to group level phenomena and leaders to followers based on the Context-for-Learning and the Leader roles from the competing values framework of Quinn and associates (Quinn & Cameron, 1983; Quinn, 1988; Quinn, Faerman, Thompson & McGrath, 2003). This computer model which showed some interesting effects based on theory and previously reported work had been developed using synthetic data and needed field testing (Black & King, 2000, 2001). Furthermore we were interested in determining the usefulness of leadership training on the development of socially created resources. We next describe the computer model and logic used by Black and associates.

The Complex Adaptive Social System Computer Model

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Complex adaptive social systems have agents who work in sub-groups have relationships with each other and their groups, who import energy (learn) and mutually co-evolve with their system (Anderson, 1999). To illustrate the inclusion of these complex adaptive system elements in the base computer model we will address each one individually.

The computational model is composed of agents and their relationships with each other and with larger systemic resources (Black & Boal, 1994). The agents each have several embedded roles. One is whether they are a leader or a follower. Another is if they are a member of a work group. The leader role is operationalized via the Competing Values (CV) profile developed from the Quinn questionnaires (Quinn, et al. 2003). The Follower role has no such profile. The group member role is operationalized as the profile from the Context-for-Learning questionnaire.

The base computer model (Black & King, 2000, 2001) also has each role associated with certain rules of interaction. For example, the influences from individual to group level are operationalized as the weighted results of position or legitimate power and personal or expertise power (French & Raven, 1959; Pfeffer, 1992; Whetten & Cameron, 1998; Howell & Costley, 2001). Expertise power is operationalized as the proportional contribution that the individual makes to the work group’s collective expertise (excluding the leader).

The rules that affect the group’s influence back onto the individual are based in the social structuration literature (Giddens, 1977). Here the work group’s influence an individual is ongoing and constant and roughly equivalent to

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the individual’s own preferences if the individual is relatively similar to the group
(Black & King, 2000, 2001) (a weighting of 50-50 group-individual) but will be
partially rejected if the group is relatively dissimilar to the individual (a
group/individual ratio of 25/75).

The relationship rules or energy importation rules that guides the changes
from one interaction to the next are the individual’s learning factors (Black &
King, 2001) for their Context-for-Learning Profile (CFLPROFILE). These factors are
based on the individual’s initial level in a particular area (discipline, stretch, trust,
support) and are modified by the individual’s Context-for-Learning index, the
group’s influence back onto an individual and any perceived leader behaviors.
The Learning Factors for each individual change over time due to changes in
each individual’s Context-for-Learning profile and influence levels. The same
general pattern also applies to the leader’s CVPROFILE. An individual’s expertise
factor grows the same way that their trust factor grows since it is an embedded
component of the trust factor (an item that represents the concept that one trusts
that someone has the expertise to do what they say they will do).

The leader’s CVPROFILE Learning Factors also change due to their use
on the job. The learning factor is based on the leader’s skill level and is modified
by the leader’s Context-for-Learning index and frequency of use. Thus the
relationship rules between time periods are defined and also change over time.

The leader is expected to take a variety of actions in daily work life which
is operationalized by Quinn and his colleagues Competing Values Framework
(Quinn et al, 2003). These actions influence the leader’s followers in varying
degrees. The influences of the leader are assumed to be noticed by all subordinates of that leader but only intermittently due to lapses in attention. However, each group member will be influenced to the degree indicated by the influence matrix for the specific embedded competence and the skill level of the behavior of the particular leader when that individual notices the leader’s behavior (Black & King, 2001). Thus the leader acts which is sometimes noticed and when noticed by a follower influences that particular follower.

Each iteration of the simulation requires a recalculation of the group level Context for-Learning index based on the current levels of the individuals involved and their current expertise proportions. This impacts the actual composition of the group Context-for-Learning. Black and King (2000, 2001) used position power and expertise power to calculate a weighted score for the group level index. The leader by virtue of his or her position contributes 50% to the group level index. The followers contribute the remaining 50% based on their relative expertise levels. These rules were also followed for this simulation and paper.

As the group and individuals change this affects future changes through the learning factors. These factors then in turn affect the future changes in the individuals who then impact the group level resulting in co-evolution of the individual and group levels of Context-for-Learning.

Notice that individual agents have identified characteristics for the organizational role they occupy and that relationships are defined that govern the interaction between individual agents, the agents and the collective, and the same agent across time. It is also evident from the above that past actions
influence future actions and that the group is both influenced by the individual and influences the individual resulting in co-evolution. Thus the major components of a complex adaptive system are found in the simulation. Given that the logic of the base model chosen appears to conform to the organizational concepts of a complex adaptive social system, we continue with our virtual experiment. We next present our hypotheses and how we operationalize necessary constructs and utilize the model.

**Hypotheses Development**

Consistent investment in training has been shown to be linked to strategic goals such as growth and profitability (Zemke, 2002). Indeed it is often a larger component of investment for smaller or service based organizations (Pangarkar & Kirkwood, 2003; Segelod, 2002). Yet, at the same time, when economic times get bad; training is often the first place that receives cuts. We argue that an organization that consistently invests in leadership training will have a supervisory staff that has less variation and higher leadership skill levels.

The simulation uses Quinn’s Competing Values Framework (CVF) (Quinn & Cameron, 1983; Quinn, 1984, 1988; Quinn, Sendelbach & Spreitzer, 1991; Quinn, Spreitzer & Hart, 1992; Denison, Hooijberg & Quinn, 1995; Quinn, Faerman, Thompson & McGrath, 2003) to operationalize leader behaviors. Granted there are other leadership or manager behavior models that could be used (cf., Howell & Costley, 2001; Phillips & Hunt, 1992; Bass, 1990; House & Mitchell, 1974; Yukl, 1989); however, since Quinn’s work has already been
incorporated, we will also use it for this paper. In Quinn’s work, several prototypical profiles have been developed (Chaotic Adaptives, Abrasive Coordinators, Drowning Workaholics, Extreme Unproductives, Aggressive Achiever, Conceptual Producer, Peaceful Team Builder, Master Manager). The Master Manager profile is suggested by Quinn to be the most successful profile.

Thus our first hypotheses are:

**Hypothesis 1a:** The leadership skill levels of supervisory staff at an organization with a consistent practice of a comprehensive investment in leadership skills will, on average, be more similar to a Master Manager profile.

**Hypothesis 1b:** The pattern of Master Manager’s found across the set of supervisory staff at an organization with a consistent practice of a comprehensive investment in leadership skills can not be accounted for by chance.

We assert that having such a consistent comprehensive pattern of leadership training will also result in having leaders that are more efficient in developing a context for learning. Since leaders typically stay with a particular workgroup for a time period of 2 to 5 years, we choose to use a 3 year time period. The computer model assumes that one iteration is equivalent to about one month of real time interactions, therefore, we hypothesize:

**Hypothesis 2a:** The developmental paths for a Context-For-Learning from the set of site leader-site group combinations will reveal an average more effective and efficient Context-for-Learning developmental path for a 40 iteration time period than the average developmental path of the full set of CV_PROFILE leader-site group combinations.

**Hypothesis 2b:** The set of leaders at a site with a consistent comprehensive pattern of leadership training will result in a set of developmental paths for a Context-For-Learning with
smaller variation across leader-group paths than the set of developmental paths of random groupings from the full set of CV\textsubscript{PROFILE} leader-site group combinations.

The above hypotheses are based in the assumption that a consistent program would have consistent results and thus would have a set of leaders whose skills are more effective than those sets of leaders from an inconsistent pattern of leadership training. It also examines the consistency aspect from the degree of variation across leader-group combinations.

A part of this virtual experiment is the comprehensive leadership training versus other more focused training efforts. While several leadership prototypes are argued in the literature to be effective (Quinn, Faerman, Thompson & McGrath, 2003; Black & King, 2001), it is important to recognize that leadership training may result in collections of leadership prototypical profiles present. Since the Master Manager is defined as being equally well at all leadership skills, we expect that the site’s set of managers will out perform all other homogenous sets of managers (no more than one of another leader profile present) except for the set of Master Managers. We thus have Hypotheses 3a-h.

**Hypothesis 3a:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively not outperform a set of Master Managers with those same groups.

**Hypothesis 3b:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively outperform a set of Aggressive Achiever managers with those same groups.

**Hypothesis 3c:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will
collectively outperform a set of Conceptual Producer managers with those same groups.

**Hypothesis 3d:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively outperform a set of Peaceful Teambuilder managers with those same groups.

**Hypothesis 3e:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively not outperform a set of Drowning Workaholic with those same groups.

**Hypothesis 3f:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively outperform a set of Chaotic Adapter managers with those same groups.

**Hypothesis 3g:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively outperform a set of Abrasive Coordinator managers with those same groups.

**Hypothesis 3h:** The site’s set of leader-group combinations of developmental paths for a Context-For-Learning will collectively outperform a set of Extreme Unproductive managers with those same groups.

From the above sets of hypotheses we expect to see that the consistent use of a comprehensive leadership training program will provide results at the leadership competency set and also at the organizational development of a Context-for-Learning.

**Virtual Experiment & Results**

Virtual experiments utilizing computer models have greater veracity if they are linked to the real world. One way to do such linkage is to take input from a real world site. For this paper, we determined that the experiment would use real
world information for leader skills and follower attributes (Noe, 1986). We would then experiment by changing out the actual leader with prototypical leaders. Quinn and his colleagues had developed a set of effective prototypical leaders: Master Manager, Aggressive Achiever, Conceptual Producer, and Peaceful Teambuilder. The Master Manager was the only profile with equally balanced skill sets.

Site Selection

Because a consistent practice of a comprehensive investment in leadership skills implies a long term commitment to a wide range of leadership training experiences, we looked for an organization that has a reputation for such a leadership program. We found this organization in the United States Armed Forces medical facility program. We assessed several nursing work groups at one of the military medical facilities during October of 2000.

Case Selection

Eight skilled nursing floor shifts participated in the study. Six cases of nursing supervisors and workgroups had sufficient leader and follower responses to be included in this virtual experiment. The work group sizes ranged from a low of 7 followers to a high of 12 followers. The responding shifts were both day and night shifts. The shifts did not include the operating room nursing staff.

Examination of Hypotheses

In examining the hypotheses, a variety of methods were used. Hypotheses 1a & 1b required a comparison of field data with the
prototypical profiles from the CVF. Hypotheses 2 & 3 involved running the virtual experiments and examining the results. Complex Adaptive system simulations cannot provide point specific predictions but can provide recognizable patterns of potential results. We define *more effective and efficient* in Hypothesis 2 to mean that the set of developmental paths for a Context-For-Learning for the site’s leader-group combinations will reach a higher value faster than the set of developmental paths for a Context-For-Learning of the random sets of leaders. We define *outperform* as mentioned in Hypothesis 3 will be revealed by a set of developmental paths for the site’s leader-group combinations that have steeper slopes and which end at a higher score than the comparison group. The processes of examination and their results are presented next.

**Hypotheses 1a**  
To examine Hypotheses 1a & 1b, we assessed supervisors and staff at an organizational site with a reputation for consistent investment in comprehensive leadership training. We then compared the leadership responses to prototypically responses derived from the work by Quinn et al. (Quinn, Faerman, Thompson & McGrath, 2003). The smallest absolute value of the average difference to a particular profile resulted in that leader being categorized as representative of that profile. To test for Hypothesis 1a (that the leaders will, on average, be more similar to Master Managers), we look to see if more than half of the managers were classified as Master Managers.

The data had two levels of leaders, supervisory level associated with six groups and two non-supervisory leaders not associated with only one group. For
the eight site leaders participating, six fit the profile of a Master Manager the best. One was categorized as a Conceptual Producer. One ineffective profile emerged that was categorized as an Extreme Unproductive. (See Table 1). Since over half were classified as Master Managers, we then calculated the overall average distances to determine the overall classification (see bottom row in Table 1). The overall average confirmed the judgment that the site-leader’s profiles were closest to the Master Manager profile. Thus Hypothesis 1a is supported.

**Hypothesis 1b**

Hypothesis 1b called for the pattern of profiles to not be accountable for by chance. Randomly generated sets of leader profiles were compared with the pattern present at the site. One thousand such patterns were generated and compared. If the duplication of the pattern from the site is less than 10 percent of the randomly generated sets, we would conclude that the pattern is the result of directed activity. No randomly generated patterns matched that found at the site. We conclude that this pattern is not randomly occurring. Hypothesis 1b is supported.

**Hypothesis 2a**

Hypothesis 2a proposed that for each group at the site that the developmental path with the leader from the site generated by the simulation would be more effective and efficient than such paths for the set of CV PROFILE leaders. 40 iterations was chosen because that was the longest number of iterations at which the variance in results approached 0 for the site leaders and
their groups and with the assumption of one iteration being one month it fell within the logical length of time of a leader in a group of 2 to 5 years. To test this hypothesis, we first calculate the average developmental paths across 1000 runs of the simulation for each of the site leaders. This was necessary because the simulation contains some stochastic elements which in turn requires multiple runs of the simulation. To model the randomly chosen set of leaders, we also run the simulation in the same fashion as for the site-leaders for each of the leader profiles (CVPROFILE) suggested by Quinn and his colleagues (Quinn, et al, 2003). We then compare these collective runs by using an average across all runs for a particular leader. It was possible to collapse the runs into an average run because the variation across each leader for a series of runs had a local maximum of only .00035. Such small variances indicated that using a summary graph would not eliminate needed information. Effective runs are defined as those computer simulation runs which end at 7 the highest value of the Context-for-Learning index. All runs reached 7. Efficient runs are defined as the number of iterations that a path takes to reach the value of 7. From the graph titled, Hypothesis 2a, we can determine that

Insert Graph Hypothesis 2a about Here.

the site-leader—site-groups on average reached the value of 7 before the set of CV-Leader—site-groups. Hypothesis 2a is supported.

Hypothesis 2b This hypothesis is looking at the variance across the set of site groups for a given set of leaders. The thought is that the variation for the site given its comprehensive leadership training program would be smaller than
would happen by chance. Happening by chance is operationalized as randomly inserting one of the CV_PROFILE leaders for each site group and calculating the average variance across those sets. The average variance for the site-leader—site-groups and the average variation across 1000 sets of the random CV-leader—site-groups are presented in Graph Hypothesis 2b (See Graph Hypothesis 2b). From this graph we can see that there is relatively great variation for the site-leader—site-group initially but that the amount of variation actually drops below the random CV-leader—site-groups at about 15 iterations. While we could argue for partial support, it should be pointed out that the maximum variance is really very very small (local maximum at .0001). Hypothesis 2b is **NOT** supported.

**Hypotheses 3a-3h**  
Hypotheses 3a-3h examined the site-leader—site-groups against homogenous sets of CV-Leader-site-groups. This meant that all the leaders of the group had the same CV-Leader. The set consisting of all Master Managers was the only homogenous group that was expected to outperform the site-leader—site-group set. The results of these virtual experiments are shown in Graphs Hypothesis 3a through Hypothesis 3h (see Graphs Hypothesis 3a through Hypothesis 3h). From these graphs we can see that for Hypotheses 3b, 3c, 3d, 3e, 3f, 3g, and 3h, the site-leader—site-group set does out perform the homogenous sets. Thus Hypotheses 3b through 3h are supported.
Hypothesis 3a is more problematic. The set which had the homogenous group of Master-Manager-leaders—site-groups did not initially out perform the site-leader—site-group as was predicted (see Graph Hypothesis 3a). Hypothesis 3a is NOT supported. It is not until about 20 iterations (see Graph Hypothesis 3a (Close Up)) that the homogenous set of Master-Managers—site-groups out performs the site-leader—site-groups. To explore this initial non-support we examined the actual input data and what was discovered was that the set of site-leaders, while having some non-Master Managers, had higher skill levels than did the values used for the Master Managers. This implies that initially the liability of having lower level managers can be offset by having some high level Master Managers but that over time having a full set of Master Managers results in a more effective and efficient developmental path.

Discussion

We opened this paper by noting that many organizations have a need for handling change in their environments and that creating a context that supports learning is a way to prepare organizations for such change. We argued that having appropriately trained leadership would be important to develop such an organizational competency. The results of our virtual simulation looking at a site which is noted for having a comprehensive and consistent pattern of leadership training (the U.S. Armed Forces medical area) demonstrates that such comprehensive and consistent patterns of training do result in a set of leaders

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which are relatively homogenous and which typify a pattern theoretically identified as most effective.

The support for Hypotheses 1a & 1b demonstrate that such patterns of leadership do not occur by chance and that the program in use resulted in well trained and well-rounded Master Manager profiles. This result implicitly argues against the on-again--off-again leadership training patterns found in many organizations. Having a relatively consistent set of Master Manager leader profiles is shown to be important for the development of a Context-for-Learning and other researchers have shown that a pattern of high levels of a Context-for-Learning are correlated with high performance (Black & Boal, 1997).

The support for Hypothesis 2a indicates that having a set of primarily Master Manager leader profiles results in better performance than a widely ranging (from effective to ineffective according to the profiles from Quinn’s work) heterogeneous set of leaders with those same groups. However, when leader profiles were randomly inserted into the work groups, the variation across the groups was less than when there was only one or two low performing leaders amongst a group of Master Manager leader profiles. Since the overall amount of variation for the groups was so small even this relative variation is not significant and so Hypothesis 2b was not supported.

Hypotheses 3a through 3h compared the relatively homogenous set of the site-leader—site-groups against other homogeneous groupings. The strongly coherent set of Master Manager profiles at the site out performed all of the prototypical homogenous sets including the homogenous prototypical Master
Manager set (Hypothesis 3a not supported). This feat was explained by noting that while the site-leaders were classified as Master Managers, they had higher skill levels than the skill levels used for the prototypical Master Managers. These higher skill levels allowed the presence of the Master Managers to offset the lower level managers that were also a part of the set of site-leaders.

Another point to note is that for this simulation all paths lead to Rome, or in this case, 7. This is an artifact of the simulation since it currently models learning as a generally increasing effect. This is because knowledge is modeled as once learned and never forgotten. An individual’s knowledge can decrease only if the group’s knowledge is lower than the individual and close enough to the individual for the individual to accept that influence. Since people do forget and lose expertise, this assumption is restrictive and bears examination in future virtual experiments.

Practitioners can take from this paper that the investment in leadership skills of their supervisory leaders pays off. Having a relatively similar set of leaders which are well trained and Master Managers results in more effective and efficient development of the strategic resource, Context-for-Learning.

This paper extends the theoretical simulation presented by Black and King (Black & King, 2000, 2001) into a field trial. The actual results accurately portrayed predicted theoretical results with minor exceptions, which we noted above, and which bear further investigation. However the value of Black and King’s computer simulation is demonstrated in its ability to explain results and clarify potential results of the relationships between individuals and groups and

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leaders and followers. The simulation also responds to several researchers calls for more dynamic research (Aldrich, 2003; Murmann, 2003). The developmental paths generated by the simulation reveal the dynamics in action across simulated time. The predictive capability of a computer model based on complexity theory is anticipated to be in patterns such as the developmental paths rather than in actual point predictions. This field test revealed that comprehensive leadership training appears to indirectly affect socially created strategic resources such as the Context-for-Learning by decreasing the variation in the timing of the development of the competence among workgroups at a work site. However, some cautions on over applying the lessons learned through this simulation must also be acknowledged.

This was only one field site and thus further examination at other sites is warranted. Examinations of other critical incident response groups would also be useful to determine if the same patterns arise in groups other than the medical field. Furthermore, only one socially created resource was examined. Further research into other socially created resources via simulations may also prove fruitful. Finally, given the importance of critical incident response teams to handle the unexpected, further research on rapidly developing such sets of leaders remains desirable.
References


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<th>Site-Leaders</th>
<th>Chaotic Adaptives</th>
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<td>1.08</td>
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<td>2.97</td>
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<td>0.46</td>
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<td>Leader 8</td>
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<tr>
<td><strong>Average distance across all Leaders</strong></td>
<td>1.29</td>
<td>1.60</td>
<td>2.30</td>
<td>2.61</td>
<td>0.84</td>
<td>0.55</td>
<td>0.70</td>
<td><strong>0.27</strong></td>
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Paper presented at 2004 British Academy of Management, St. Andrews, Scotland
Hypothesis 3f

Context For Learning

Chaotic Adapter--Groups
6 Site Leaders--Groups

Iterations

Hypothesis 3g

Context For Learning

Abrasive Coord.--Groups
6 Site Leaders--Groups

Iterations

Hypothesis 3h

Context For Learning

Extreme Unprod.--Groups
6 Site Leaders--Groups

Iterations